Deriving Code Sets for Pupils with Physical Disabilities from the International Classification of Functioning, Disability and Health, for Children and Youth (ICF-CY)

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Abstract

To facilitate the equal participation of pupils with disabilities in inclusive education, assessments and supports for them should be conducted based on an interactive approach between the medical and social models of disability. To achieve this goal, South Korea recently established a new law offering holistic support for pupils with disabilities–that is, on both the individual and environmental levels. However, in comparison with the comprehensive support provided by special education services, the assessments required for children to be eligible for special education services still rely on diagnostic evaluations in the medical model. This discrepancy between diagnostic evaluations (medical model) and special education services (interactive model) has hindered effective inclusive education to encourage the full participation of pupils with disabilities in South Korea.

The International Classification of Functioning, Disability and Health for Children and Youth (ICF-CY) has been recommended as a valuable framework and tool for comprehensive assessment and support in special education services, from both the individual and social perspectives. The ICF-CY was developed to offer a universal classification system available for documenting childhood functioning and health by the World Health Organization in 2007. The ICF-CY can help record a profile of individual children's functioning and development in a holistic way, ranging from the characteristics of each individual child to the environment surrounding them. For this reason, many countries around the world have introduced the ICF-CY in special education services to provide comprehensive assessment and support.

Whilst the comprehensiveness of the ICF-CY contributes to a holistic assessment for more effective provision of special education services, its extensive classification items have been regarded as a major challenge to its efficient application. Thus, this study was conducted to increase the utility of the ICF-CY for a holistic assessment in Korean special education services by asking national experts to identify essential categories of functioning of pupils with physical disabilities in different school age groups. Delphi method, as a formal consensus procedure, was used to derive three code sets for pupils with physical disabilities corresponding to three age groups: 3–5 years (preschool age), 6–12 years (elementary school age), and 13–18 years (secondary school age). The representative sample consisted of 35 national experts in rehabilitation and special education, as well as parents from national parents' organizations; all completed a succession of iterative e-mail surveys to rate the

relevance and appropriateness of the categories on the functioning of pupils with physical disabilities comprising the age-based “ICF-CY Code Sets for Pupils with Physical Disabilities.” The final code sets will contribute to resolving the discrepancy between diagnostic evaluation and holistic special education services, by serving as profiles for the functioning and development of pupils with physical disabilities, which can be used in various disciplines related to special education services in South Korea.

Keywords: *interactive approach, medical and social models of disability, special education services, ICF-CY, holistic assessment, ICF-CY Code Sets for Pupils with Physical Disabilities*

Foreword

First of all, I would like to express my gratitude for my experiences as a special educator, and to thank Steinar Theie and Siri Wormnæs, associate professors at the Department of Special Needs Education, University of Oslo, who introduced me to the International Classification of Functioning, Disability and Health for Children and Youth (ICF-CY). Through my work experience as a special educator for seven years in both a special and mainstream school, I recognized the importance of having comprehensive information about pupils with physical disabilities to plan and suitably adapt education to them. For instance, information about the pupils' body functions was important for their safety and health in school life; information about their degree of activity and participation was helpful in creating an individualized curriculum for them in the classroom; and knowledge of the environmental factors surrounding such pupils provide critical information in applying devices and amenities to facilitate teaching-learning. These personal experiences make me to look for a more systematic framework for providing such holistic assessment and support. Recently, a new special needs education law enacted in South Korea has required holistic support for pupils with physical disabilities to ensure their full participation in school activities, but has continued to focus on only diagnostic evaluations of individual children's impairments related to the disease, without providing further assessment of the social or environmental factors affecting their functioning when planning this education; the absence of a holistic assessment means that pupils with physical disabilities will continue to struggle to participate in many school activities. However, just in time, Steinar Theie and Siri Wormnæs delivered a lecture on the ICF-CY, which possesses a holistic framework and uses common terminology to record and understand a child's holistic functioning, including various environmental factors. It was as if I had reached an oasis in the desert. So, I quickly decided to conduct research on the ICF-CY in order to resolve this absence of holistic assessment for pupils with physical disabilities and enhance their full participation in school activities. As such, I deeply appreciate my working experience, Steinar Theie, and Siri Wormnæs and thank the University of Oslo, for this wonderful research opportunity and the resources with which to pursue it.

I also thank the many people and organizations who have helped me in my research, both financially and practically. First, I must thank the Korean Government for a generous national scholarship. In addition, I wish to thank Taehyeon Kim, the executive director of the Korean Solidarity for the Human Rights of Disabled People with Brain Lesions (KSHB), for helping

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I especially thank my supervisor, Peer Møller Sørensen, for encouraging me as well as pointing me in the right direction during the course of my research. Many thanks also to Professor Eungyeong Shin, a researcher who helped in the development of the ICF Checklists for Korean people with disabilities, for advising me about this study during the fieldwork phase in South Korea. Moreover, I am very thankful for the aid and warmth of my wonderful fellow students.

Last but not least, I really would like to thank my wife for her devotion, as well as my mother and friends for their encouragement and love.

Kind regards,

Sangwon Yoon

Oslo, May 2013

Dedication

To my dearest Bohey, without your understanding and support this thesis would not exist.

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Abbriviations

ICD	International Classification of Diseases
ICIDH	International Classification of Impairments, Disabilities and Handicaps
ICF	International Classification of Functioning, Disability and Health
ICF-CY	International Classification of Functioning, Disability and Health, version for Children and Youth
UN	United Nations
UNESCO	UN Educational, Scientific and Cultural Organization
WHO	World Health Organization
ASEDP	Act on Special Education for Disabled Persons, Etc.
IEP	Individualized Education Plan
b	Body functions (according to the ICF/ICF-CY)
s	Body structures (according to the ICF/ICF-CY)
d	Activities and participation (according to the ICF/ICF-CY)
e	Environmental factors (according to the ICF/ICF-CY)

1 Introduction

To facilitate the equal participation of pupils with disabilities in general education, appropriate assessments must be conducted and support given, particularly through an interactive perspective between the medical and social models (Hollenweger & Moretti, 2012; Wedell & Lindsay, 1980). The medical model views disability as a shortcoming, or as a set of features, directly caused by disease, which require individual treatment from professionals (Lindsay 2003). In contrast, the social model sees disability as a socially constructed barrier, and not at all an attribute of the child (Lindsay, 2003). Norwich (2002) claims that these two models must be integrated and understood through an "interactive perspective" to be suitable for inclusive education. In this interactive perspective, the UN Convention on the Rights of Persons with Disability suggests that disability "results from the interaction between persons with impairments and attitudinal and environmental barriers that hinders their full and effective participation in society on an equal basis with others" (United Nations [UN], 2006, preamble (e)). Wedell and Lindsay (1980) insisted that the assessment and support in special education services must be done through an interactive perspective, encompassing the physical and psychological factors within the child and the environmental factors surrounding the child for effective inclusive education. For instance, in the case of a pupil without legs, a wheelchair and a ramp is necessary in order for him or her to access the school and school activities. Furthermore, therapeutic support for increasing arm strength would also be required, in order for this child to move the wheelchair.

To achieve full participation of pupils with disability in inclusive education, South Korea recently enacted a new law offering support to pupils with disability, taking into account both the individual and environmental factors. This new law came after the abrogation of the Special Education Promotion Act, which focused on therapeutic education at the individual level. Newly enacted in 2007, the Act on Special Education for Disabled Persons, Etc. (ASEDP), emphasized holistic support targeting both the individual and their environment (Solidarity for the Education Rights of the Disabled, 2007). By inserting a new clause on "service related to special education," which includes family support, medical support, assistant personnel, assistive technology devices, learning assistant units, school attendance support, and access information support, in Article 28 (Ministry of Education, Science, and Technology [MEST], 2007), the ASEDP established a legal basis for offering comprehensive support, ranging from individual support such as medical services to environmental support,

such as technology devices. To realize this change, each district educational office is required to install a Special Education Support Center in their local school districts, according to Article 30 of the ASEDP (MEST, 2007); this Support Center offers diagnostic assessments, vocational education support, and various other services related to special education. Comprehensive special education services are then planned and offered through individual education plans (IEPs), which are based on an initial diagnostic assessment from the Special Education Support Center (MEST, 2007).

However, compared with this range of support services, the diagnostic assessment that determines each child's IEP still relies on the medical model in South Korea (Jo, 2011); that is, official assessments for determining eligibility for special education services are conducted only focusing on individual deficits in terms of physical functioning and learning. For example, special education services for pupils with physical disabilities are provided on the basis of a medical examination and their scores on the Basic Academic Skills Assessment (BASA), which is an academic skill assessment tool specified by the ASEDP (MEST, 2007). While this type of diagnostic assessment focusing only on the actual deficits may help identify which pupils have disabilities, it does not identify what services these pupils need (Hollenweger & Moretti, 2012). As a result, IEPs are not based on a comprehensive assessment, and therefore the inclusive education is not being managed efficiently. To overcome this discrepancy between the diagnostic evaluation in medical model and the holistic special education services, it is imperative to develop a framework and corresponding tool for comprehensively assessing the functioning of pupils with disabilities, from both the medical and social perspectives.

The International Classification of Functioning, Disability and Health for Children and Youth (ICF-CY) provides a valuable framework and tool for comprehensively assessing a pupil's functioning for special education services, from both of the aforementioned perspectives (Adolfsson, 2011; De Polo, Pradal, Bortolot, Buffoni, & Martinuzzi, 2009; Hollenweger & Moretti, 2012; Moretti, Alves, & Maxwell, 2011; Park & Kim, 2012; Sanches-Ferreira et al., 2012; Simeonsson, 2009; Tokunaga, 2006). The ICF-CY, which is based on the International Classification of Functioning, Disability and Health (ICF) for adults (Word Health Organization [WHO], 2001), is a standardized language and framework for the description of health and health-related states in children and youth (WHO, 2007). Health and various

health-related components are classified as health domains1 and health-related domains.2 These reflect some aspect of functioning at the body, individual, or social levels, grouped into two lists: (1) Body Functions and Structures, and (2) Activities and Participation.3 "Functioning" is an umbrella term to denote a positive condition in body functions and structures, as well as various activities and participation; similarly, "disability" is an umbrella term for bodily impairments, activity limitations, and participation restrictions. Since children's functioning and disability always occur in a context, the ICF-CY also lists environmental factors that interact with all these constructs. In this way, the ICF-CY helps to build a profile of individual children's functioning and disability from a holistic perspective, encompassing the children's characteristics to the surrounding environment (Hollenweger & Moretti, 2012; Park & Kim, 2012; Simeonsson, 2009).

Many countries have implemented the ICF-CY in special education services for comprehensive assessment and support. In Europe, Portugal, Switzerland, Italy, France, and England use the ICF-CY not only for educational assessment for pupils with disabilities but also to provide training courses for teachers and special educators (Park & Kim, 2012). On a national level, Portugal and Switzerland have mandated use of the ICF-CY in the provision and eligibility of special education services (Hollenwegner, 2011; Sanches-Ferreira et al., 2012). At the provincial level, Treviso province in Italy implemented the ICF-CY to improve collaborative support for pupils with disabilities between schools and public health systems, particularly in assessing and planning services (De Polo et al., 2009). In Asia, the National Institute of Special Needs Education in Japan has published a manual on the use of the ICF-CY (Park & Kim, 2012). In addition, many schools in Japan mainly make use of the ICF-CY as a framework for planning IEPs for pupils with disabilities, as well as assessment tool for planning IEPs for pupils with disabilities (Park & Kim, 2012).

Even though the comprehensiveness of the ICF-CY contributes to its effectiveness as a holistic assessment for providing special education services, the enormous set of classification items is regarded as a major challenge to its efficient application (Ellingsen, 2011). The ICF-CY consists of 1,656 classification items relating to body functions and structures, activities and participations, and environmental factors. One strategy for enhancing the utility of the

[1] These refer to various abilities such as seeing, hearing, walking, learning, and remembering.
[2] These refer to aspects related to health, such as mobility, education, and social interaction.
[3] Each domain is a relevant list of related physiological functions, anatomical structures, tasks, or actions by an individual or involvement in a life situation.

ICF-CY would be to develop code sets–that is, reduced classification codes identified as the most essential for a particular purpose or setting to describe and profile child functioning and disability (Ellingsen, 2011; Hollenweger & Moretti, 2012; Simeonsson, 2009).

Therefore, to improve the efficiency of special education services in South Korea, it would be necessary to develop ICF-CY code sets for pupils with disabilities in a specifically Korean context. To that end, this study was conducted to develop a code sets defining the standard minimal ICF-CY categories essential for documenting the functioning of pupils with physical disabilities in different ages groups (3–5 years old, 6–12 year old, and 13–18 year old) to derive the "ICF-CY Code Sets for Students with Physical Disabilities." Through one- or three-round surveys, the ICF-CY code sets were derived from a consensus among physiatrists, special educators, parents, and professors of special education.

1.1 Aims and Research Questions

The overall aim of this study was to extract the essential codes reflecting the functioning of pupils with physical disabilities within three age groups (preschool age: 3–6 years old; elementary school age: 7–12 years old; secondary school age: 13–18 years old) that are applicable within a Korean context and could be used to determine children's eligibility for special needs services. These codes were extracted through the consensus of physiatrists, parents, special educators, and professors of special education.

The research questions for this study were as follows:

- What codes of the ICF-CY are particularly relevant for assessing the body functions and structures of pupils with physical disabilities in three age groups (3–6 years old, 7–12 years old, and 13–18 years old)?
- What codes of the ICF-CY are particularly relevant and appropriate for assessing the activities and participation, as well as the environmental factors, of pupils with physical disabilities in each age group?

1.2 Terminology

Before moving on to the main research contents of this paper, the concept and scope of the significant terms to be used throughout the paper is clarified in this subchapter.

1.2.1 ICF-CY

The International Classification of Functioning, Disability and Health for Children and Youth (ICF-CY) is a universal classification system of child health and disability to record the developmental characteristics of children and the impact of the surrounding environments on these children (WHO, 2007). It offers standardized international taxonomy for providers, consumers, and all those concerned with the health, education, and well-being of children and youth. The aim of this taxonomy is to enhance the documentation and measurement of child development and health (WHO, 2007). The ICF-CY includes categories (or codes) for describing the social, educational, and functional needs of children, in addition to their medical needs (Ellingsen, 2011). The categories are organized into the following domains: (1) Body Functions and Structures, (2) Activities and Participation, and (3) Environmental Factors.

1.2.2 Body Functions & Structures

Body functions are the functions of bodily systems, including psychological functions (WHO, 2007). Body structures are the anatomical parts of the body such as organs, limbs, and their myriad components. Impairments in body function or structure refer to any significant deviation or loss of one or more of these constructs.

1.2.3 Activities & Participation

“Activity” refers to the execution of a task or action by an individual. “Participation” is any involvement in a life situation (WHO, 2007). Activity limitations are difficulties that individuals may have in executing activities. Participation restrictions are problems an individual may experience in his or her involvement in life situations.

1.2.4 Environmental Factors

Environmental factors make up the physical, social, and attitudinal environment in which people live and conduct their lives (WHO, 2007). These factors are external to individuals and can have either a positive or a negative influence on individuals' performance as members of society, capacity to execute actions or tasks, or body functions and structures.

1.2.5 Functioning and Disability

"Disability" is an umbrella term for body impairments, activity limitations, and participation restrictions (WHO, 2007). Conversely, "Functioning" is integrity in body functions, body structures, activity, and participation in life events. Functioning and disability share reciprocal influence with environmental factors: thus, neither functioning nor disability is static, and they are instead in constant flux due to their interactive relationships with environmental factors.

1.2.6 ICF-CY Code Sets

There are 1,656 categories or codes to describe childhood functioning in the ICF-CY (WHO, 2007). This considerable number of codes is what presents an enormous challenge to its application (Ellingsen, 2011; Hollenweger, 2008; Moretti, Alves, & Maxwell, 2012). Thus, developing reduced sets of codes (or code sets) that would essentially define the standard minimum content necessary for accurately documenting child functioning in each domain is one strategy for increasing the utility of the ICF-CY.

1.2.7 Pupils with Physical Disabilities

This study defined pupils with physical disabilities by using both the legal and practical definitions of physical disability. In other words, pupils with physical disabilities in this study include both pupils with physical disabilities defined in the ASEDP and pupils with cerebral palsy. According to Article 10 of the ASEDP, pupils with physical disabilities are defined as pupils "having difficulty in educational achievement due to functional and physical disability or physical conditions and states that suffer from sustaining the trunk or moving the limbs" (MEST, 2008). In addition, this study included pupils with cerebral palsy because over 80% of pupils in special schools for students with physical disabilities have cerebral palsy (Myeng,

2008) and approximately 50% of all pupils with physical disabilities have cerebral palsy (Korea National Institute for Special Education [KNISE], 2001). Cerebral palsy is "a group of permanent disorders of the development of movement and posture, causing activity limitation, that are attributed to non-progressive disturbances that occurred in the developing fetal or infant brain" (Rosenbaum et al., 2006, p. 9). The motor impairments of cerebral palsy are often accompanied by intellectual, communicational, and sensory impairments due to damage of specific areas of the brain related to intellect, communication, and sense (Rosenbaum et al., 2006).

1.3 Outline of the Thesis

This paper begins with an introduction chapter (Chapter 1) on the research topic, aims, questions, and terminology. Following this, the literature review (Chapter 2) offers an overview of the relevant literature associated with the three approaches to disability to serve as a framework in the subsequent analyses, and provides a description of ICF-CY, including relevant previous studies related to other ICF-CY code sets. Next, the methodology (Chapter 3) presents the overview of the Delphi method as this research method as well as the plan for data analysis. Then, the findings from the one or three rounds of surveys are described in the results section (Chapter 4). The items of the final ICF-CY Code Sets for Pupils with Physical Disabilities, which were derived through a formal consensus procedure, are provided at the end of this chapter. Finally, a summary of the findings and the implications of these findings are presented in the discussion section (Chapter 5).

2 Literature Review

This literature review is divided into five major subchapters. The first subchapter (2.1) discusses the three theoretical approaches (models) to disability to address the interactive model of the ICF-CY, which serves as the main conceptual framework for this study. Then, the second subchapter (2.2) presents a background of the ICF-CY to provide greater understanding of the history and development of the ICF and ICF-CY, as well as the concepts of functioning and disability as they are used in the ICF-CY. Section 2.3 describes the structure and various codes of the ICF-CY. Next, the fourth subchapter (2.4) not only describes about the application of the ICF-CY for special education services to show its value in the field, but also introduces concrete examples of countries that have implemented ICF-CY for comprehensive assessments and support in special education services. Finally, the section 2.6 provides an explanation of the ICF-CY code sets as the most effective one of the ways to improve the utility of the ICF-CY. The literature review concludes with how this study was conducted in accordance with the rationale and methods of previous researches on the development of relevant ICF-CY code sets.

2.1 Approaches to Disability

This subchapter begins with a discussion of the medical and social approaches to disability (2.1.1 and 2.1.2), and then moves on to describe the interactive approach as an integrated model between the medical and social approaches (2.1.3). The interactive approach is a highly practical model for ensuring effective inclusive education, and also serves as the conceptual framework of the ICF-CY. Furthermore, the interactive approach was used as the analytic framework for this study.

2.1.1 Medical Approach: Disability as Impairment

The medical approach, or medical model, conceptualizes disability as individual impairments that are directly derived from some deficit or disease in a person (Abberley, 1987; Oliver, 1990). In other words, this model views disability as the physical and mental problems of a person that require remediation and treatment by professionals. For this reason, it focuses on only identifying the particular problems within an individual under the assumptions of normality and abnormality (Florian et al., 2006). Accordingly, diagnostic assessments and

prescriptions consist of lists of individual problems, and professionals predominantly determine and offer special services only as a means to correct abnormal internal functions (Oliver, 1996). Thus, according to the medical model, disability is a problem that lies solely within the person.

Some disability advocates and scholars have criticized the medical model for aggravating stigmatization and segregation while overlooking the social environment (Abberley, 1987; Barn 2003; Oliver, 1990; Pfeiffer, 2002). The medical model essentially divides humanity into two kinds of people–those with and those without disabilities–according to assumptions of normality and abnormality, which makes it easy to judge a person with disabilities as abnormal or problematic, and hence stigmatize them (Abberley, 1987; Oliver, 1990; Pfeiffer, 2002). These negative labels and attitudes eventually offered a basis for segregating people with disabilities from society by putting them into special institutions or schools (Oliver, 1996). This is because the medical model does not take into account the discriminations that people with disabilities might suffer, and the numerous physical and social barriers (Abberley, 1987; Oliver, 1990) to their proper functioning that they will encounter.

The medical model is still prevalent in special education, despite its failure to account for children's individual needs (Florian et al., 2006). In particular, in most countries, eligibility for special education services mainly depends on diagnostic assessments, which only quantifies the physical and cognitive problems of individual pupils through medical diagnoses and standardized tests (Hollenweger & Moretti, 2012). However, this type of assessment is not successful in generating meaningful information on the needs of pupils with disabilities to ensure their equal participation in school activities (Florian et al., 2006). For instance, in South Korea, the provision of special education services for pupils with physical disabilities are determined on the basis of medical examinations and their score on the Basic Academic Skills Assessment (BASA), a standardized academic skill test that was specifically named in the ASEDP (MEST, 2007). However, simply assessing individual problems in physical or mental functions and academic skills do not provide as much information as is needed to identify the diverse needs of pupils for special education. For example, even if two pupils, both having physical disabilities, received the same medical diagnosis and score on the BASA test, the type and level of support should still differ if one of these pupils has a congenital physical disability and the other an acquired physical disability. Although there would be no difference in the diagnostic assessment between them, pupils with acquired physical

disabilities may experience more psychological and physical barriers in adjusting to their environment or in participating in school activities. This is because social participation experiences and environment can still differ widely between pupils, even if their level of functios is the same. Information such as a diagnosis of cerebral palsy and 80 points on the BASA test may be helpful in providing appropriate therapeutic services and determining the academic skill levels of pupils, but it does not provide information on the complex environmental factors that can bar equal participation in school activities, such as people's attitudes towards them and the building structure.

2.1.2 Social Approach: Disability as Social Barrier

The social approach, or social model, of disability is a reaction to the predominant medical model (Oliver, 1990). While the latter assumes that individuals are disabled by their own impairments, the social model assumes the opposite: people with impairments are disabled by socially constructed barriers (Abberley, 1987). The social model sees disability as a set of physical and psychological barriers that people with impairments often experience in society, such as inaccessible building structures and negative attitudes. Furthermore, this model distinguishes between impairment and disability: "impairment" is the loss or limitation of physical, mental, or sensory function on a long-term or permanent basis; in contrast, "disability" is the disadvantage or restriction of activity or participation caused by a society that takes little or no account of people who have impairments. For example, impairments would refer to learning difficulties, physical impairments, sensory impairments, facial disfigurement, speech impairment, mental illness, mental distress, and so on; disability would include discrimination and social oppression, such as racism or sexism. Therefore, disability according to the social model is completely the result of social barriers.

The social model is politically very meaningful for changing environments, yet less persuasive in fully explaining the effect of impairments on the experiences of the individuals with those impairments. Shakespeare and Watson (2001) suggest that the social model overlooks the role of the impairment itself as a disabling factor, instead excessively focusing on disability as social oppression. For example, a person who recently experienced a spinal injury will almost inevitably need spinal rehabilitation, and possibly counseling. Subsequently, environmental alterations surrounding him or her will be vital, including those related to housing structure, family members' attitudes towards disability, and disability pension. Thus,

both individual and environmental interventions appear to be the key to progressive change, but one cannot replace the other (Shakespeare & Watson, 2001).Therefore, disability should not be understood as a dichotomy between social barriers and impairments, but as "a complex dialectic of biological, psychological, cultural and socio-political factors" (Shakespeare & Watson, 2001, p. 24).

Although the social model has allowed for pupils with disabilities to equally participate in general education by altering inclusive education policy, it is illogical and unhelpful in practice due to its whole emphasis on the social dimension (Lindsay, 2003). The social model of disability has been effective in developing legislation based on human rights arguments, but it ignores individual differences by placing excessive emphasis on social barriers (Low, 2001). However, to ensure successful inclusive education for pupils with disabilities in practice, the within-child factors, from weakness to strength of a child, must be considered as important as environmental factors (Lindsay, 2003). For instance, for pupils with cerebral palsy, it would be useful for school officials to know what parts of their bodies are in a spastic condition. According to information on body function, teachers can not only facilitate participation by encouraging the use of body parts without spasticity but also adapt learning materials and tasks to each child's body functions.

2.1.3 Interactive Approach: Disability as Individual-Environment Interaction

As pointed out above, there are weaknesses in both the medical and social models, with the former model positing that disability is exclusively caused by impairments within the person, whereas the latter views disability as being wholly caused by socio-environmental barriers. Beffring (1997) criticized the medical model for paying attention to only the problems and weaknesses of the individual, leading to labeling and its attendant stigmatization. In addition, Shakespeare (2006) argued that even if the social model emerged as a reaction to the worst aspects of the medical model, it still overlooks the contribution of intrinsic factors and the possibility of interactions between intrinsic and extrinsic factors, by construing only external social factors as those that disable individuals.

To avoid both over-individualizing problems through the medical model and over-socializing problems through the social model, disability should be holistically understood as the result of an interactive relationship between individuals and their environment (Engel, 1978; Florian et al., 2006; Gustavsson, 2004; Lindsay, 2003; Norwich, 1990; Shakespeare, 2006; Shakespeare

& Watson, 2002; Simeonsson, Simeonsson, & Hollenweger, 2008; Thomas, 2008; Tøssebro, 2004). In this respect, Shakespeare (2006) suggests that disability should be understood from a holistic perspective, which would resolve the contradictions between policy and practice for persons with disabilities, described as follows:

> *The experience of a disabled person results from the relationship between factors intrinsic to the individual, and extrinsic factors arising from the wider context in which she finds herself. Among the intrinsic factors are issues such as: the nature and severity of her impairment, her own attitudes to it, her personal qualities and abilities, and her personality. Among the contextual factors are: the attitudes and reactions of others, the extent to which the environment is enabling or disabling, and wider cultural, social and economic issues relevant to disability in that society (pp. 55–56).*

For successful inclusive education policy and practice for pupils with disabilities, Wedell and Lindsay (1980) argued that pupils' functioning and their needs should be conceptualized as an interaction between their inherent characteristics and various environmental supports and barriers. This is known as the interactive model of disability. This model offers a more balanced perspective, recognizing that learning difficulties and additional support needs are derived from the complicated interaction of multidimensional factors within the pupils themselves as well as in their immediate and wider learning environment, including the classroom and home, as well as their laws and culture (Lindsay, 2003). In addition to individual and environmental factors, the interactive model adds "time" as a third influencing factor, because the former two factors will often change dramatically over time. This model also underlines the compensatory interactions between difficulties and strengths, which means that difficulties in one domain can be compensated by strengths in another, and can be found in the overall developmental context of each child. Consequently, children's difficulties and needs can be adequately compensated through interactions between the three abovementioned factors (Wedell & Lindsay, 1980). Therefore, an interactive analysis of learning needs provides a more complete and holistic approach to understanding children's difficulties, which would help in improving the support policies and practices in inclusive education (Winter & O'Raw, 2010).

The interactive model has its roots in Bronfenbrenner's bio-ecological system theory (Desforges & Lindsay, 2010); therefore, it would be helpful to interpret this model from Bronfenbrenner's viewpoint. Bronfenbrenner (1979) explained human behavior and development in terms of three dimensions, as with the interactive model: individual, environment, and time. Human development is the progressive and mutual process between a

growing human body and the changing environments–environments ranging from the immediate family or community to the wider culture–over time. That is, children's physical development helps them broaden their activity boundaries environmentally, while environmental changes from home to school or community would in turn help them develop physically and mentally. Conversely, in this dialectical process over time, children may encounter restrictions in their activities and participation because of gaps between their level of development for individual functioning and changes in their social environment at specific periods. For instance, pupils who must use wheelchairs may not encounter difficulties in math classes, but they would typically face difficulties in physical education. However, they would be much more free from such difficulties at university, because they could not only choose the courses that interested them but also would be capable of judging what courses would be appropriate for them according to their impairment. Furthermore, they could logically complain and debate about environmental barriers in some courses. All are possible because of the environmental transition from school to university and accompanying cognitive development within these pupils over time.

Similar to the interactive model, the WHO's International Classification of Functioning, Disability and Health version for children and Youth (ICF-CY) is also a framework for viewing disability in interactive perspective of the medical and social models (WHO, 2007). The ICF-CY model defines disability as an umbrella term consisting of three main elements: impairments in body functions and structures, limitations in activities, and restrictions in participation. The individual dimensions of disability include body functions and structures (i.e., mental or physiological function and anatomical structures) and activities (i.e., ability to perform actions). In addition to individual level, societal dimension includes participation (i.e., the experience of being a part of society). These three aspects of disability are affected by health condition and contextual factors (personal factors and environmental factors); health conditions (i.e., presence of disease or disorder) and personal factors (i.e., gender, race, and age etc.) are within-child dimension; environmental factors (i.e., physical, social, and attitudinal environments) are totally external dimension. As Figure 2.1 shows, disability is the result of the complex interaction between all six dimensions (Adolffsson, 2011).

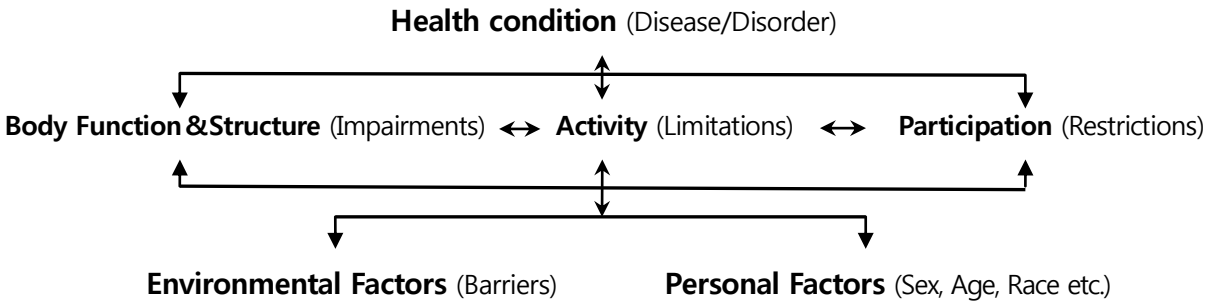

Figure 2.1. ICF-CY Interactive Approach to Disability. Adapted from Simeonsson (2009) and WHO (2007).

The ICF-CY classifies and offers a range of components of health, organized into domains of body functions and structures, activities and participation, and environmental factors, rather than merely classifying diseases. Disease classification codes in health condition domain are classified in the International Classification of Diseases, Tenth Revision (ICD-10), which is a sister classification of the ICF-CY and an etiological framework to record morbidity data based on medical diagnosis of diseases of disorders (Adolffsson, 2011). Namely, the ICF-CY is the functional framework classifying health outcomes, not etiological framework classifying health problems such as disease or disorder directly. However, the WHO recommends that the ICF-CY and ICD together use to enhance the understanding of a wide range of information about health (WHO, 2007). In addition, the personal factors are not specifically coded due to the wide variability among cultures or societies (WHO, 2007).

Above all, the ICF-CY is a classification for mapping both internal and environmental needs in a developmental perspective (Ellingsen, 2011). The ICF-CY has additional components that set it apart from the ICF for adults, because childhood and adolescence is a period of dramatic development in the body and mind as well as in the surrounding environments, compared with adulthood (WHO, 2007). This is not merely a transitional period in the surrounding environment (e.g., from being at home to going to school, or from being a pupil to a worker), but also a period of rapid development in the body and mind (e.g., puberty, psychological development). In this regard, the additional components of the ICF-CY reflect the changeable developmental characteristics of children and youth over time (Ellingsen, 2011; Florian et al., 2006; Simeonsson et al., 2008).

In conclusion, the ICF-CY is an appropriate conceptual framework and classification for analyzing within-child and environmental factors to provide more efficient inclusive education to pupils with disabilities (Hollenweger, 2011; Hollenweger & Moretti, 2012; Moretti et al., 2012; Sanches-Ferreira et al., 2012). This is because the ICF-CY offers a

framework for viewing all three dimensions of disability (individual, environmental, chronological) according to the interactive model (Wedell & Lindsay, 1980), and offers a comprehensive classification system for all of the concrete components of health, including individual, societal, and environmental factors (WHO, 2007). This classification system accommodates not only information on functioning relevant to participating in school activities (e.g., capacity to learn, communicate, interact with others, perform tasks and demands), but also significant information for understanding all factors that contribute to difficulties in learning and development (e.g., body impairments, environment at home or school, personal factors). Hence, to explore exactly which components of the ICF-CY can be used to comprehensively assess the functioning of pupils with physical disabilities in a range of developmental stages, this study determined whether various codes extracted from the ICF-CY can accurately reflect children's development or environmental changes over time. In other words, this study used the interactive approach to disability as a conceptual framework for analyzing the results.

2.2 Background of the ICF-CY

This subchapter provides some background knowledge on the ICF-CY. It has mainly the same concept of disability as the ICF for adults, except that it has additional content specifically for children and youth. Nevertheless, it is important to understand the characteristics of the ICF-CY in relation to the ICF for adults. Thus, this subchapter begins with the historical background of the ICF for adults, leading into the development of the ICF-CY, which was used to better reflect the developmental aspect of childhood and related disability. Next, the purpose of the ICF-CY is introduced in this subchapter. Finally, the specific concepts of functioning and disability as used in the ICF-CY are presented.

2.2.1 History of the ICF

The history of the ICF is closely linked with that of the ICD and the International Classification of Impairment, Disabilities, and Handicaps (ICIDH), and should be viewed alongside the historical development process of the medical and social models (KSHB, 2012). All of the abovementioned classifications are frameworks developed by the WHO for describing a wide range of information about health. Before 1980, when the ICIDH was developed, disability was described as a disease or disorder by using ICD which is a disease

classification to record morbidity data for medical diagnosis (Yonsei University Center for Social Welfare Research & Samyook Rehabilitation Center, 2009). In other words, this classification treated disability as totally individual disadvantage caused by bodily impairment within a person. However, growth of disability rights movement after 70s required to shift the perspective about the causality of these disadvantages from individual impairments to social barriers. In the 1970s, various disability rights movements arose, led by disability rights organizations such as the Union of the Physically Impaired Against Segregation (UPIAS) in the UK (Oliver, 1996). The UPIAS in particular insisted that disability was "the disadvantage or restriction of activity caused by a contemporary social organization which takes no or little account of people who have ... impairments and thus excludes them from the mainstream of social activities" (Union of the Physically Impaired Against Segregation & Disability Alliance, 1976, p. 20). In other words, disability was mainly the result of social discrimination, regardless of the individual impairments of the person. With the influence of this newly emerging social model of disability, the WHO expanded the concept of disability to include societal factors by developing the ICIDH (Yonsei University Center for Social Welfare Research & Samyook Rehabilitation Center, 2009). The ICIDH described disability in terms of impairment, disability, and handicap. As in Figure 2.2, the ICIDH explains the process whereby people with diseases or disorders become impaired and the subsequent social disadvantages resulting from such impairments. First, a health condition such as a disease or disorder causes some form of impairment (i.e., any loss or abnormality of psychological, physiological, or anatomical structure or functions), which then leads to a disability (i.e., any restriction or lack of ability to perform an activity), which, in turn, leads to handicap (i.e., the experience of being in a disadvantageous position compared with people without disabilities) in a society (WHO, 1980).

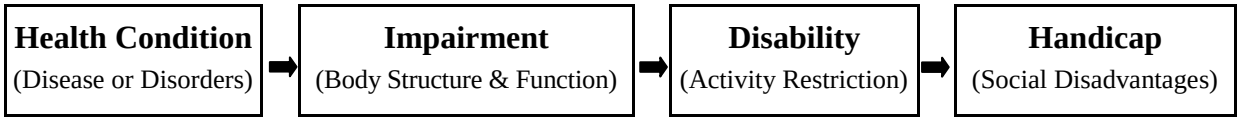

Figure 2.2.The Disability Model of the WHO International Classification of Impairment, Disabilities, and Handicaps (ICIDH). Adapted from WHO (1980).

Although the ICIDH was a critical advance in the field because it included social factors (or "handicaps") for the first time–these had been exclusively ignored by the medical model (Anderson & Bury, 1988; Bury, 1996)–it still tended to be perceived as reflecting the medical model because "impairments" in individuals' bodies was what essentially determined their disability and their handicap (Oliver, 1996). Hence, these definitions were strongly opposed

by organizations run by disabled people, such as Disabled Peoples International (DPI) (Barnes & Mercer, 1997). Moreover, around the 1980s, understanding disability and developing practical strategies that took into account environment factors as significant contributors to disability had become viewed as increasingly necessary on both the national and global levels (Hurst, 2003). Thus, the WHO developed the ICF as a model that integrated the medical and social models, emphasizing an interactive relationship between individual health conditions and environmental factors that impact people's overall health, instead the linear causality of individual body impairments creating disability (WHO, 2001).

2.2.2 Development Background of the ICF-CY

The ICF is a standardized classification framework for describing health and health-related states (WHO, 2001). It defines the various components of health and the health-related components of well-being, and does not merely focus on the consequences of disease as previous classifications had (WHO, 2001). As mentioned previously, these components consist of body functions and structures, activities and participation, and environmental factors. Thus, the ICF helps describe the functioning of each individual by considering the whole of them–their bodies, ability to perform activities, and level social participation, along with environmental factors–without the use of traditional disability categories or diagnoses (Moretti et al., 2012). In other words, the ICF classifies people's specific functioning for daily life and the various environmental factors affecting such functioning. According to traditional disability classifications, impairments such as back problems, missing limbs, and stroke were classified as physical disabilities. In contrast, the ICF might describe these as disabilities in activity ability or environment, without labeling them as specifically physical disabilities; thus, they could be termed, "impairment in mobility joints" (body functions and structures), "limitations of moving activities" (activity), "restrictions in community life" (participation), and "barriers of building structures" (environmental factors).

However, even though the ICF provided a comprehensive taxonomy of health and functioning, it did not include the defining developmental characteristics of children and youth; thus, the WHO created the ICF-CY (WHO, 2007). It was believed that the ICF was not sensitive enough for assessing functioning specific to children (Simeonsson, 2008). Compared with adulthood, the first two decades of life are characterized by rapid growth and development, with significant changes in physical, social, and psychological functioning, as well as the

surrounding environment (WHO, 2007). Furthermore, the manifestations of functioning, disability, and health conditions in childhood are different from those in adulthood (WHO, 2007). To account for these differences, characteristics related to the growth and development of children and adolescents were identified and added to the ICF in developing the ICF-CY (Simeonsson et al., 2008). The ICF-CY is also based on the same framework as the ICF, and thus includes all of the content in the adult ICF with additional content to reflect developmental characteristics from birth to 18 years old (Lenonardi & Martinuzzi, 2009; WHO, 2007). Thus, the ICF-CY provides a conceptual framework and a common terminology to record multiple perspectives of functioning across infancy, childhood, and adolescence, including the physical and mental functions such as movement, attention, memory, and calculation; various activities and participation such as play, learning, family life, and education; and environmental factors such as required technology or support for education, the attitudes of family and friends towards disability, and the educational system.

2.2.3 Purpose of the ICF-CY

The ICF-CY is a multipurpose classification designed for use in a diverse range of disciplines and different sectors. According to the WHO (2007), the ICF-CY aims:

- to offer a scientific basis for understanding and studying health and health-related states, outcomes, and determinants from infancy to adolescence;
- to establish a common language for describing health and health-related states of children and youth so as to enhance communication between different users such as clinicians, social workers, educators, policy makers, family members, and researchers;
- to compare statistical data on health in childhood across countries;
- to provide a systematic coding scheme for childhood health information systems;
- to stimulate service development in order to increase levels of social participation among children and youth with disabilities.

In other words, the overall purpose of the ICF-CY is to provide a standard language and conceptual framework for documenting the health, functioning, and development of children and youth.

2.2.4 Functioning and Disability in the ICF-CY

The ICF-CY, as with the ICF, utilizes the interactive approach to disability and functioning (WHO, 2007). Thus, as shown in Figure 2.3, functioning and disability within the ICF-CY are the result of a complex interaction between six dimensions reflecting various intrinsic and extrinsic causes (Adolffsson, 2011).

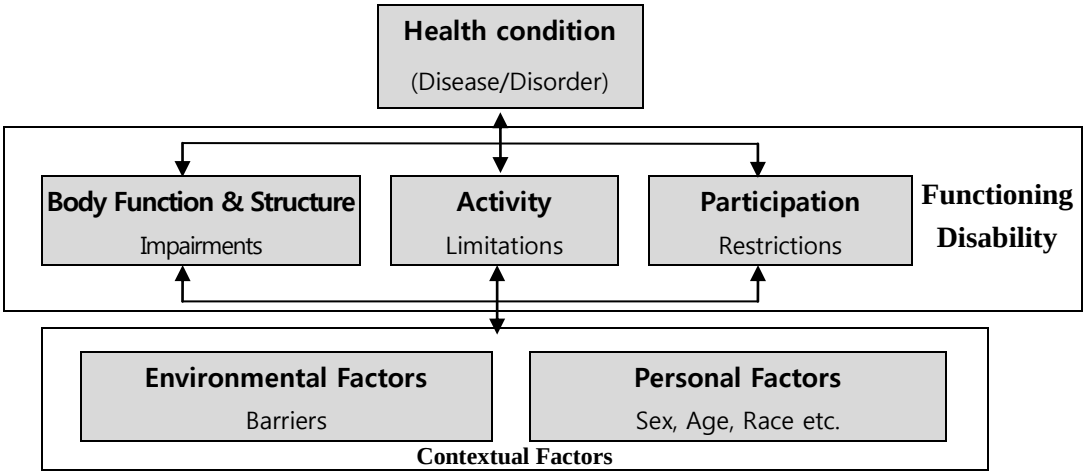

Figure 2.3. ICF-CY Interactive Approach to Disability. Adapted from Simeonsson (2009) and WHO (2007).

As with the ICF, the ICF-CY defines functioning and disability as an umbrella term with three components: body functions and structures (i.e., mental or physiological function and anatomical parts), activities (i.e., ability to perform actions), and participation (i.e., experience of being part of society). Thus, functioning and disability may range from integrity in body functions and structures, activity, and participation to impairments in body functions and structures, limitations in activity, and restrictions in participation (See Figure 2.4).

Figure 2.4. Range of Functioning and Disability in the ICF-CY. Adapted from ICF Research Branch (n.d.).

The individual dimensions in functioning and disability include body functions and structures as well as activity. In addition to individual level, the societal dimension of functioning and

disability includes participation. These three aspects of disability are affected by health conditions (i.e., diseases or disorders), personal factors (i.e., gender, race, age etc.), which are internal, within-child factors; and environmental factors (i.e., physical, social, and attitudinal environments), which are completely external factors. In conclusion, functioning and disability in ICF-CY are the outcome of the interaction between within-child factors and external factors.

The ICF-CY ensures the use of etiologically neutral terms for disability and functioning. As such, the ICF-CY is a universal model in the sense that it can be used to describe the functioning of all children, and not only children with disabilities. Disability according to the ICF-CY is not the simply consequence of disease, but refers to any impairments, activity limitations, or participation restrictions that are affected by individuals' health conditions and context factors (WHO, 2007). Impairments in body functions and structures represent "a deviation from certain generally accepted population standards" of functioning (WHO, 2007, p. 11). It does not necessarily imply the presence of a disease or disorder. Indeed, the etiology of the deviation, as disease or disorder, is not the concern of the ICF-CY, but is more the focus of its sister classification, the ICD-10. Thus, disability and functioning within the ICF-CY are neutral from an etiological perspective.

2.3 Structure and Codes of the ICF-CY

The ICF-CY consists of two main parts, each with two components. The first part is functioning and disability, which consists of the Body Functions and Structures, and Activities and Participation components. Compared with the model in Figure 2.2, activities and participation are merged into one component. The functioning and disability part of the ICF-CY is construed through four separate constructs. Body Functions and Structures can be construed through changes in physiological systems or anatomical structures, respectively; Activities and Participation are construed though "capacity" and "performance." These constructs can be explained by applying qualifiers, and will be described later. Positive aspects (i.e., "integrity") in both Body Functions and Structures as well as Activities and Participation, are expressed as "functioning," while negative aspects are expressed as "disability" (i.e., impairments in body, activity limitations, or participation restrictions). The second part of the ICF-CY concerns contextual factors. The first component is environmental factors (physical, social, or attitudinal aspects of environment), which can be qualified as

either facilitators or barriers to functioning. Personal factors, the second component, is a means of describing the background information of a child's life, including gender, race, age, fitness, religion, lifestyle, and habits. However, these factors have not yet been classified in the ICF-CY because of their considerable social and cultural variance across the world. An overview of the ICF-CY structure is provided in Table 2.1.

Table 2.1. *Overview of the ICF-CY Structure. Adapted from the WHO (2007).*

<table>
<tr><th></th><th colspan="2">Part 1: Functioning and Disability</th><th colspan="2">Part 2: Contextual Factors</th></tr>
<tr><td>Components</td><td>Body Functions and Structures</td><td>Activities and Participation</td><td>Environmental Factors</td><td>Personal Factors</td></tr>
<tr><td>Domains</td><td>Body Functions
Body Structures</td><td>Life areas
(tasks, actions)</td><td>External influences on functioning and disability</td><td>Internal Influences on functioning and disability</td></tr>
<tr><td>Constructs</td><td>Change in body functions (physiological)

Change in body structures (anatomical)</td><td>Capacity
Executing tasks in a standard environment

Performance
Executing tasks in the current environment</td><td>Facilitating or hindering impact of features of the physical, social, and attitudinal world</td><td>Impact of attributes of the person</td></tr>
<tr><td rowspan="2">Positive Aspect</td><td>Functional and structural integrity</td><td>Activities
Participation</td><td rowspan="2">Facilitators</td><td rowspan="2">not applicable</td></tr>
<tr><td colspan="2">Functioning</td></tr>
<tr><td rowspan="2">Negative Aspect</td><td>Impairment</td><td>Activity limitation
Participation restriction</td><td rowspan="2">Barriers</td><td rowspan="2">not applicable</td></tr>
<tr><td colspan="2">Disability</td></tr>
</table>

The ICF-CY classification consists of chapters under each of the four components illustrated in Figure 2.5. Compared with the main structure (See Table 2.1), the body dimension is divided into two parallel components, Body Functions and Structures. In each chapter, categories with titles and related term definitions are listed hierarchically with increasing specificity, going down to two, three, or, in certain cases, four levels (Simeonsson, Sauer-Lee, Granlund, & Björck-Å kesson, 2010; WHO 2007). This thesis used only 2nd level categories in all components of the ICF-CY, because the WHO recommends using only 2nd level categories for surveys or assessments for educational or clinical objectives, as they are well suited for describing particular cases (Ministry of Health & Welfare [MHW], 2004).

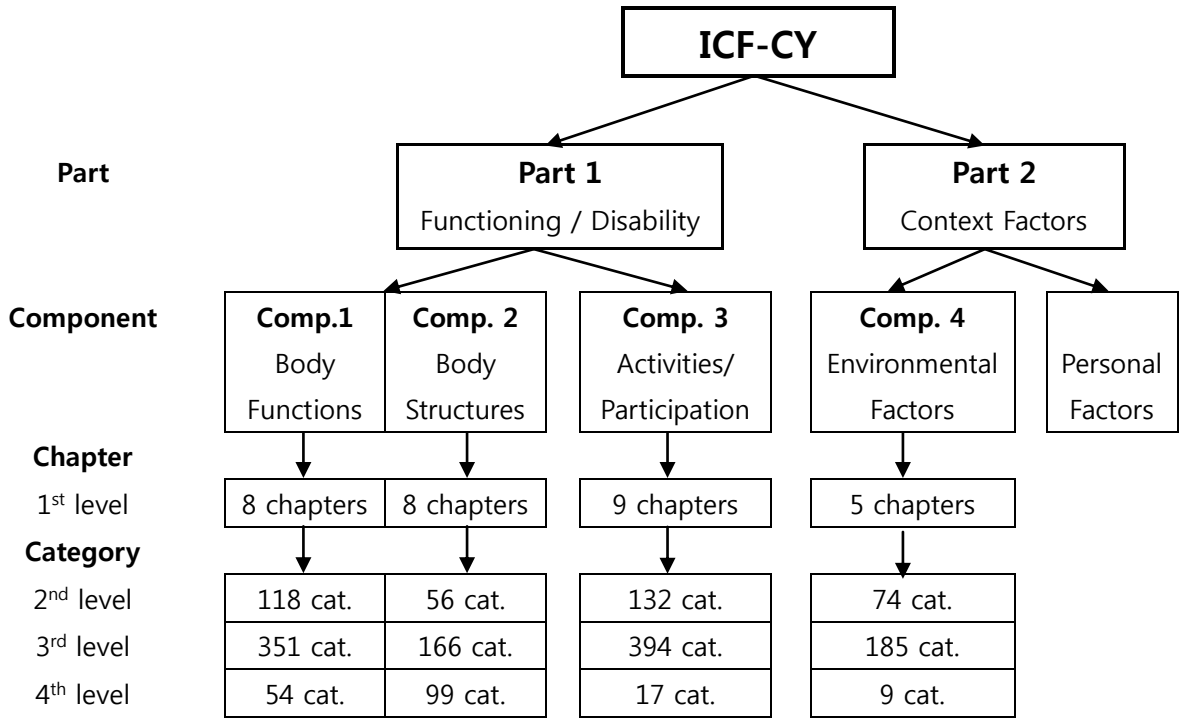

Figure 2.5. Structure and Categories of the ICF-CY. Adapted from Adolfsson (2011).

The ICF-CY uses alphanumeric codes beginning with a letter to denote the component, followed by digits to indicate the level of detail of the categories (See Figure 2.6). However, personal factors have not yet been classified in the ICF-CY. The letters for denoting the components are as follows: Body Functions begin with the letter "b"; Body Structures with "s"; Activities and Participation with "d"; and Environmental Factors with "e." Following the letter, a series of numbers represent the chapter (first level) and categories (second level), as well as the more specific subcategories (third or fourth level).

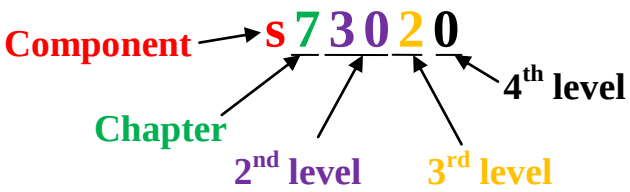

Figure 2.6. Alphanumeric Codes of the ICF-CY. Adapted from the ICF Research Branch (n.d.).

The specificity of functions of the categories increases hierarchically from the first to the fourth level. When appropriate, categories are merged into blocks of codes. Furthermore, depending on the specific codes, third or fourth level categories may be. Figure 2.7, as follows, shows an example of the categories and codes in the Activities and Participation component.

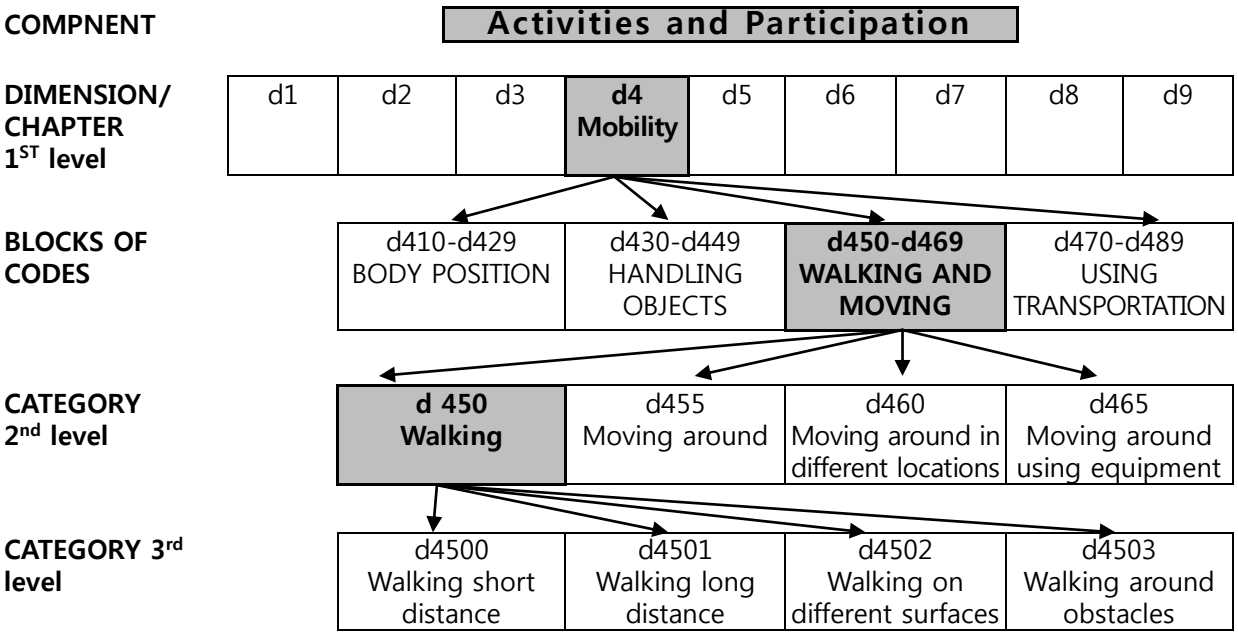

Figure 2.7. Hierarchically Listed Categories in the Activities and Participation component, Chapter "d4 Mobility". Adapted from Adolfsson (2011).

Each of the ICF-CY classification codes is accompanied by at least one qualifier. These qualifiers give meaning to the codes, and are dependent upon the component. Without the qualifiers, the codes have no meaning. Qualifiers denote the magnitude or level of health for that code–that is, the severity of impairment in body functions and structures, limitation or restriction in activities and participation, and barrier in environmental factors or the level of facilitator of environment for health or functioning. Qualifiers are indicated as one or more numbers after a decimal point following a code (See Figure 2.8).

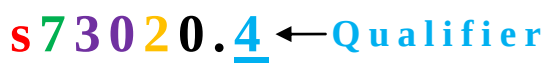

Figure 2.8. ICF-CY Code with Qualifier. Adapted from the ICF Research Branch (n.d.).

2.3.1 Body Functions & Structures

The Body Functions and Structures component of the ICF-CY is divided into the two eponymous classifications: "Body Functions," which refers to the physiological functions of body systems, both physical and psychological; and "Body Structures," which refers to the anatomical parts of the body, such as the organs, limbs, and their various components, including the brain and nervous system. Body Functions and Body Structures are separately classified but parallel chapters (See Table 2.2).

Table 2.2. *Chapters or One-level Classification in the ICF-CY Component Body Functions & Structures. Adapted from WHO (2007).*

Components	**Body Functions**				**Body Structures**
Code Letter	**b**				**s**
Chapters		**8 Parallel Chapters**			
Chapter 1	Mental functions	**b1**	↔	**s1**	Structures of the nervous system
Chapter 2	Sensory functions and pain	**b2**	↔	**s2**	The eye, ear and related structures
Chapter 3	Voice and speech functions	**b3**	↔	**s3**	Structures involved in voice and speech
Chapter 4	Functions of the cardiovascular, haematological, immunological and respiratory functions	**b4**	↔	**s4**	Structures of the cardiovascular, immunological and respiratory systems
Chapter 5	Functions of the digestive, metabolic and endocrine system	**b5**	↔	**s5**	Structures related to the digestive, metabolic and endocrine systems
Chapter 6	Genitourinary and reproductive functions	**b6**	↔	**s6**	Structures related to the genitourinary and reproductive systems
Chapter 7	Neuromusculoskeletal and movement-related functions	**b7**	↔	**s7**	Structures related to movement
Chapter 8	Functions of the skin and related structures	**b8**	↔	**s8**	Skin and related structures

For instance, within Body Functions, "b3 Voice and speech functions" has a corollary within Body Structures, "s3 Structures involved in voice and speech." In other words, both classifications are arranged according to the same body system taxonomy.

The Body Functions and Structures component uses a qualifier to address the severity of impairment, using values ranging from 0 to 4, corresponding to "no," "mild," "moderate," "severe," and "complete impairment," respectively (See Table 2.3). The severity of impairment can then be scaled according to percentages calculated from relevant population standards for different components. However, the qualifier also may be scaled by referring to the person's self-report about their health.

Table 2.3. *Qualifiers for Body Functions & Structures in the ICF-CY. Adapted from WHO (2007).*

Code	Level of Impairment	Qualitative Descriptors for Impairment	Percentages
xxxx.0	No	None, absent, negligible…	0 – 4 %
xxxx.1	Mild	Slight, low…	5 – 24 %
xxxx.2	Moderate	Medium, fair…	25 – 49 %
xxxx.3	Severe	High, extreme…	50 – 95 %
xxxx.4	Complete	Total…	96 – 100 %
xxxx.8	Not specified		
xxxx.9	Not applicable		

2.3.2 Activities & Participation

An activity refers to the execution of a task or action by individuals, such as writing, calculating, moving, or using transportation; it reflects an individual aspect of functioning. In contrast, participation is defined as involvement in a life situation, and corresponds to a social aspect of functioning. Thus, the Activities and Participation component covers the full range of life areas, from basic learning to various social tasks. Although separating activities and participation is possible theoretically, it is often difficult or unclear to divide these categories practically, because most personal activities are some form of societal participation; furthermore, most forms of social participation take place through individual activities. Therefore, the code scheme is a single merged list of nine chapters corresponding to various life areas (See Table 2.4).

Table 2.4. *Chapters/First-level Categories in the ICF-CY Activities & Participation Component. Adapted from WHO (2007).*

Code	Chapter name	Code	Chapter name
d1	Learning and applying knowledge	d6	Domestic life
d2	General tasks and demands	d7	Interpersonal interactions and relationships
d3	Communication	d8	Major life areas
d4	Mobility	d9	Community, social and civic life
d5	Self-care		

The Activities and Participation component has qualifiers denoting the degree of difficulty it takes to perform an activity or participate, ranging from 0 to 4, which correspond to "no," "mild," "moderate," "severe," and "complete difficulty," respectively (See Table 2.5). As with the previous component, the degree of difficulty may be scaled according to percentages calculated by referencing relevant population standards in various domains, or it can be scaled according to people's self-reports or observation and interviews by a professional about their activities and participation.

Table 2.5. *Qualifiers for Activities & Participation in the ICF-CY. Adapted from the WHO (2007).*

Code	Level of Difficulties	Qualitative Descriptors for Difficulties	Percentages
xxxx.0	No	None, absent, negligible…	0 – 4 %
xxxx.1	Mild	Slight, low…	5 – 24 %
xxxx.2	Moderate	Medium, fair…	25 – 49 %
xxxx.3	Severe	High, extreme…	50 – 95 %
xxxx.4	Complete	Total…	96 – 100 %
xxxx.8	Not specified		
xxxx.9	Not applicable		

In this component, there are two main qualifiers: "capacity" and "performance." First, the performance qualifier denotes "what a person does in his or her current environment" (WHO,

2001, p. 15). For example, if a person is not only using assistive devices but is also receiving help from personal assistants, the person's performance will be evaluated in a life situation according to these aids. In contrast, if a person does not usually receive such aid, the person's performance will be assessed without the aids. In addition, the capacity qualifier describes the extent to which individuals are able to execute a task or an action in a standardized environment (WHO, 2001). That is, capacity refers to the degree of being capable of executing an action when the same conditions are given.

The concept of performance and capacity is closely related to whether Environmental Factors affects activities and participation as facilitators or barriers. In other words, when executing a task or an action in the Activities and Participation component within the current environment is better than within a standardized environment, this means that the current environment facilitates activities and participation; that is, performance in the current environment is better than the capacity in a standardized environment, meaning that the current environment operations as a facilitator for activities and participation. Conversely, when the performance qualifier is lower than the capacity, then the environment is a barrier and hinders activities and participation. However, because it is not easy or clear to evaluate capacity within a standardized environment, the qualifiers for Activities and Participation are generally performance.

2.3.3 Environmental Factors

Environmental Factors are external influences on functioning and disability. They include the physical, social, and attitudinal factors present in the environment surrounding a person (See Table 2.6). Moreover, these factors facilitate or hinder all components of functioning and disability, including the Body Functions and Structures component as well as the Activities and Participation component.

Table 2.6. *Chapters/First-level Categories in the ICF-CY Environmental Factors Component. Adapted from WHO (2007).*

Chapter code	Chapter name
e1	Products and technology
e2	Natural environment and human-made changes to environment
e3	Support and relationships
e4	Attitudes
e5	Services, systems and policies

The qualifiers for Environmental Factors use a similar scale as those used for the other two components, ranging from 0 to 4. However, Environmental Factors qualifiers are divided into "facilitators" and "barriers" to denote the extent to which they have positive or negative effects on functioning, respectively. Therefore, in Table 2.7, facilitators are denoted by a plus sign (+) instead of a point.

Table 2.7. *Qualifiers for Environmental Factors in the ICF-CY. Adapted from WHO (2007).*

Code	Level of Barriers	Code	Level of Facilitators
xxx.0	No barrier	xxx.+0	No facilitator
xxx.1	Mild barrier	xxx.+1	Mild facilitator
xxx.2	Moderate barrier	xxx.+2	Moderate facilitator
xxx.3	Severe barrier	xxx.+3	Substantial facilitator
xxx.4	Complete barrier	xxx.+4	Complete facilitator
xxx.8	Not specified	xxx.+8	Not specified
xxx.9	Not applicable	xxx.+9	Not applicable

2.3.4 Example of Functioning Assessment Using ICF-CY Codes

Every code can describe a child's functioning and the environmental factors affecting that functioning by using qualifiers. As can be seen above, all components of the ICF-CY–Body Functions and Structures, Activities and Participation, and Environmental Factors–can be quantified to describe and assess a child's functioning and environmental factors in a particular daily life situation. For example, let us assume the case of a pupil with cerebral palsy: Kim, a 13-year-old pupil with cerebral palsy, has difficulties in oral communication. In order to improve his oral communication skills, he receives professional support from a speech therapist once a week. He has no problems in one-on-one talks with his friends or classroom teachers, yet he shows difficulty in participating in group discussions because he worries that he will be teased by his peers because of his inarticulate speech. As such, he is experiencing a challenge in participating in school activities such as class meetings.

The description of the above case can be interpreted using ICF-CY codes and qualifiers. For instance, the pupil with cerebral palsy shows a mild or slight difficulty in speaking (d330.1) due to moderate or medium impairment in his articulation functions (b320.2). Although he has no difficulty in face-to-face conversation with friends or teachers (d350.0) owing to speech therapy for facilitating his individual conversation skills (e580.+2), he still shows moderate or fair difficulty in group discussion (d355.2). This is because of the perceived negative attitudes of his peers about his inarticulate speech, which serves as a moderate

barrier (e325.2) affecting his group discussion ability. Thus, this barrier makes him passively participate in school activities such as class meetings (d835.1). Kim's case can be described in the functioning profile chart in Table 2.

Table 2.8. *Example Functioning Profile Based on the ICF-CY. Adapted from the ICF Research Branch (2012)*

BODY FUNCTIONS AND STRUCTURES		**Impairment**					
			0	**1**	**2**	**3**	**4**
b320.2	Articulation functions						
ACTIVITIES AND PARTICIPATION		**Difficulty**					
			0	**1**	**2**	**3**	**4**
d330.1	Speaking						
d350.0	Conversation						
d355.2	Discussion						
d835.1	School life and related activities						
ENVIRONMENTAL FACTORS		**Facilitator or Barrier**					
		+4	**+3**	**+2**	**+1**	**0**	**1**	**2**	**3**	**4**
e580.+2	Health services, systems and policies									
e325.2	Acquaintances, peers, colleagues, neighbours and community members									

2.4 ICF-CY for Special Education Services

The ICF-CY was developed to provide a standardized language for describing childhood functioning and disability across a range of professionals for multidisciplinary purposes, such as use in clinics, education, social work, health care policies, and research (WHO, 2007). Thus, the ICF-CY is a very useful conceptual and practical framework for special education services, which require the collaboration of a multidisciplinary team in the assessment and support of pupils with disabilities, including therapists, special educators, social workers, doctors, and parents. Consequently, in order to explore the utility of the ICF-CY for multidisciplinary special education services, this subchapter first describes the validity and reliability of the ICF-CY (2.4.1) as a multidisciplinary framework and language for assessing childhood functioning. Next, the contribution of the ICF-CY in special education services is presented (2.4.2). This subchapter concludes with national application examples of the ICF-CY for special education services (2.4.3).

2.4.1 Validity and Reliability of the ICF-CY

To develop the ICF-CY, the ICF-CY workgroup formed a multidisciplinary team of experts from 23 countries (McLeod & Threats, 2008). These scholars collaborated to identify valid and reliable concepts and factors explicitly reflecting childhood functioning and disability,

and attempted to reach a consensus on terminology and crucial issues concerning childhood health classification. To achieve interdisciplinary agreement and develop a multidimensional approach to childhood health, these scholars were recruited from a range of professional fields, including psychology, special education, occupational therapy, speech-language pathology, rehabilitation, and medicine.

Moreover, the ICF-CY has been extensively field tested by professionals from a range of disciplines in Italy, Japan, Sweden, the USA, and Sudan (McLeod & Threats, 2008). One of the ICF-CY workgroups, the Children-Health-Intervention-Learning-Development (CHILD) group at Mälardalen University in Sweden, conducted field trials from 2002 to 2004 to examine the validity and reliability of the ICF-CY using a draft; in addition, they attempted to evaluate the utility of the ICF-CY as a method of documentation for service provision (Ibragimova, Bjorck-Akesson, Granlund, Lillvist, & Eriksson, 2005). The results showed that the ICF-CY has good reliability and validity (Ibragimova et al., 2005), meaning that it shows high consistency between raters from different disciplines, and content of the ICF-CY accurately reflects childhood functioning when using the codes and qualifiers. The adequate validity and reliability of the ICF-CY, verified by numerous other scholars from different disciplines across the world, is what led this study to utilize the ICF-CY in special education services, which truly requires interdisciplinary assessment and cooperation by special educators, psychologists, therapists, social workers, parents, and so on.

Especially at the school level, a qualitative study by Tulinius (2008) showed that the ICF-CY is a very useful framework and tool for understanding pupils' functioning and needs in relation to their surrounding environment. Through interviews, Tulinius (2008) found that teachers perceived that application of the ICF-CY helped them not only to see a more holistic picture of their pupils' situations than they had before but also to plan individualized education for each pupil, serving as a useful instrument to map child functioning and environment. Moreover, Tulinius (2008) found that teachers better understood the importance of cooperation between those persons close to each child after using the ICF-CY. However, they found that the classification was somewhat overly comprehensive and complicated, and suggested that the ICF-CY be clarified before it is widely adopted for schools.

2.4.2 Contribution of the ICF-CY for Special Education Services

According to Simeonsson et al. (2008), the ICF-CY can make at least seven contributions to special education services. First, at the universal and national levels, the ICF-CY can be a standardized reference that not only defines the rights of children with disabilities but also can document social and environmental factors restricting or hindering children's participation in education and community related to children's rights. Every component of the ICF-CY conforms to international conventions and declarations on the rights of children with disabilities (WHO, 2007), including the UN Convention on the Rights of the Child (UN, 1989), the Salamanca Statement on the Right to Education (UNESCO, 2001), and the UN Convention on the Rights of Persons with Disabilities (UN, 2006). Thus, documenting the categories and codes of the ICF-CY may offer evidence for guaranteeing the rights of children and youth with disabilities (Simeonsson et al., 2006).

Second, the ICF-CY can serve as a framework allowing for the integration of multidisciplinary efforts in assessment, intervention, and monitoring. The ICF-CY provides a common taxonomy or language of childhood functioning, which can enhance communication between professionals (WHO, 2007), including educators, therapists, doctors, and social workers as well as policy makers, parents, and researchers. In particular, since special education services require the cooperation of professionals from various specialist areas, including social work, clinical fields, and vocational education (Park & Kim, 2012), the ICF-CY, by serving as a common language for childhood functioning, may improve the overall practice of special education services, from initial assessments to outcome monitoring.

Third, the ICF-CY can create profiles of individual children's functioning, which can then aid in the design of appropriate eligibility criteria based on the nature and extent of functional limitations in specific contexts. As mentioned in the above functioning profile (2.3.4), the ICF-CY can create a profile of pupils' problems, including their body functions and structures, activities and participation, and the environmental factors that facilitate or hinder functioning. These profiles may help improve eligibility criteria for provision of special education services.

Fourth, the ICF-CY can be used for planning IEPs. In practice, most special education facilities merely determine children's eligibility for special education services according to administrative categories or medical diagnoses, and do not provide any further information on children's individual functional characteristics, which are necessary for planning education. In

contrast, the ICF-CY can build a profile of each child's limitations in functioning, activities, and participation, as well as underline the environmental factors that may impact such functioning. These profiles can provide practical information for planning IEPs for each pupil.

Fifth, the ICF-CY can guide professionals' selection of instruments for assessment and outcome monitoring. Although the ICF-CY is not an assessment instrument per se, it still serves as a framework that can aid in the development of new instruments that are more accurate and valid for measuring important domains, such as activities (Wells & Hogan, 2003), participation (Forsyth & Javis, 2002), and environmental factors (Simeonsson et al., 2008). Furthermore, the current emphasis on evidence-based practice can facilitate the development of instruments to monitor the outcomes of special education services.

Sixth, the ICF-CY, through its use of severity qualifiers and codes, can help document changes in child functioning and environments over time. For example, a decrease in the severity qualifier value of a code from "complete" (4) to "moderate" (2) can show a positive change or development from an earlier assessment to a later one.

Finally, the ICF-CY can help increase the precision of various statistical databases used for educational planning. The results of a functional assessment using the ICF-CY can provide direct information on the human and material resources required for special education services for each child. In addition, the ICF-CY can help determine the number of pupils who require special education services in a certain period. Thus, if both the number of pupils and the amount of resources can be systematically documented and managed through databases, professionals would be able to better predict the prevalence of pupils eligible for special education services, and the resources budget for the best possible provision of those services.

2.4.3 National Application of the ICF-CY for Special Education Services

Both the WHO and the UN have recommended that countries integrate the ICF and ICF-CY into their disability policies to ensure that persons with disabilities retain their human rights (MHW, 2004). This has led many countries to conduct research on the effectiveness of the ICF and ICF-CY as parts of various social policies aimed at persons with disabilities (KSHB, 2012). Some countries have already implemented use of the ICF-CY on a national level for special education services. For instance, Portugal, Switzerland, and Italy use the ICF-CY in educational assessments of pupils with disabilities or special needs. In particular, Portugal and

Switzerland have officially mandated use of the ICF-CY in the provision and eligibility of special education services (Hollenwegner, 2011; Sanches-Ferreira et al., 2012). Moreover, France, Belgium, and England provide training courses based on the ICF-CY for general teachers and special educators (Park & Kim, 2012). In Asia, the National Institute on special Needs Education in Japan has developed and published two manuals on the use of the ICF and ICF-CY in educational settings. Using these manuals, many schools in Japan have utilized the ICF-CY as a framework and assessment tool for planning IEPs for pupils with disabilities (Park & Kim, 2007).

Specifically, Portugal directly integrated both the ICF and ICF-CY (specifically the language) into its special education laws and mandated the use of the ICF-CY classification system for describing the functional characteristics of pupils applying for special education services (Castro, Pinto, & Simeonsson, 2012; Moretti et al., 2012). For functional assessments, descriptions are written using the ICF-CY taxonomy, including the three main components of functioning and disability in Activities and Participation, Environmental Factors, and Body Functions components (Sanches-Ferreira et al., 2012). All assessments are conducted by interdisciplinary teams consisting of health professionals, educational psychologists, parents, and general and special teachers. In addition, if the interdisciplinary team concludes that a pupil has significant limitations in their activities and participation, the IEP for that pupil will be planned to provide appropriate special education services utilizing the results of the assessment based on the ICF-CY (Sanches-Ferreira et al., 2012).

2.5 ICF-CY Code Sets

This subchapter presents the current challenges in using the ICF-CY (2.5.1). In addition, as an effective way to overcome these challenges, the ICF-CY code sets (2.5.2) is introduced. Finally, after analyzing previous relevant research on the ICF-CY, the rationale and methods of this study, which focus on the developing of ICF-CY code sets for pupils with disabilities, are finally addressed (2.5.3).

2.5.1 Challenges of Using the ICF-CY

Although the comprehensiveness of the ICF-CY is considered one of its strengths, it has also been regarded as a “major challenge to its practicality” (Stier-Jarmer, Cieza, Borchers, &

Stucki, 2009, p. 30). The ICF-CY consists of 1,685 codes for describing the functioning and disability of children across a considerable range in ages, from birth through 18 years (WHO, 2007). However, such an enormous body of information is not necessary for assessing specifically pupils requiring special education services. For example, the code "d825 Vocational training" in Activities and Participation generally would not be relevant for pre-school or elementary school pupils under the age of twelve, because developmental characteristics and socially expected roles differ in each period and situation. Above all, it is necessary to identify the required information among the numerous codes without spending considerable time and resources.

2.5.2 Code Sets

In order to overcome this challenge in the application of the ICF-CY, it would be helpful to group together codes that are essential for a specific purpose (Simeonsson, 2009). These lists of essential categories or codes for measuring health and health-related states for particular aims can generally be derived through agreement among experts, and these lists could then be used as checklists for practitioners (Cieza, Ewert et al., 2004; Escorpizo et al., 2010). In the medical area, such lists are called core sets. Most core sets have been developed with a focus on specific symptoms or disease, including particular chronic health conditions affecting adults such as lower back pain, depression, and stroke (Cieza, Chatterji et al., 2004; Cieza, Stucki, et al., 2004; Geyh et al., 2004). For children, core sets have only recently begun to be developed, such as those for children with cerebral palsy and autism spectrum disorders (Castro & Pinto, 2013; Schiariti et al., 2013); additional ICF-CY categories can be added, intended to represent the minimum clinical standards for identifying, and hence treating, a particular health condition or disorder (Ellingsen, 2011).

Other such sets that focus purely on functioning are called code sets, and consist of essential categories that can be used for specific purposes instead of particular diseases or disorders (Simeonsson, 2009). In services settings such as early intervention and special education, code sets have been recently developed and promoted, including developmental codes sets and codes sets targeting communication (Ellingsen, 2011; Rowland et al., 2012). Therefore, for deriving the essential categories for special education, this study used the term "code sets" over "core sets."

2.5.3 Development Researches of the ICF-CY Code Sets

Since the development of the ICF (WHO, 2001) and the ICF-CY (WHO, 2007), numerous studies deriving core sets, and some deriving code sets, have been conducted. First, ICF core sets for 15 chronic conditions were developed by the ICF Research Branch of the WHO, the WHO Classification, Assessment and Survey (CAS) team, and the Ludwig-Maximilian University in Munich (Stier-Jarmer et al., 2009) to ensure a standardized international consensus on these common chronic health conditions, which included lower back pain (LBP), obesity, stroke, depression, breast cancer, chronic widespread pain, osteoarthritis, osteoporosis, rheumatoid arthritis, chronic ischemic heart disease, diabetes mellitus, obstructive pulmonary diseases, head and neck cancer, multiple sclerosis, and spinal cord injury. After these initial 15 core sets, and beginning around 2001, numerous scholars have sought to derive ICF/ICF-CY core sets for all existing chronic diseases or disorders (Schiariti et al., 2013; Yonsei University Center for Social Welfare Research & Samyook Rehabilitation Center, 2009).

In addition to research on core sets, Rowland et al. (2012) developed ICF-CY code sets for pupils who rely on augmentative and alternative communication (AAC). With this code set, they were able to create a profile of AAC, which not only integrates information about the numerous, multidimensional factors influencing communication skill development in general but also can be specifically used to assess pupils who have complex communicational needs between grades kindergarten and 12. For a broader purpose, Ellingsen (2011) developed the "ICF-CY developmental code sets," which serve as a universal reference for the minimum amount of information necessary for appropriately assessing child development in clinical practice, research, and policies for application in a global multidisciplinary context. Specifically, Ellingsen developed four code sets on the basis of commonly recognized developmental stages to reflect the rapid developmental and environmental changes that occur over the first two decades of life: (1) infancy and toddlerhood, reflecting birth until 3 years of age; early childhood, reflecting 3 to 5 years of age; middle childhood, reflecting 6 through 12 years of age; and adolescence, reflecting 13 through 17 years of age. Based on the above code set studies, this study was planned to derive code sets for pupils with physical disabilities in three school age groups (i.e., 3–5 years old, 6–12 years old, and 13–18 years old).

Most development studies on ICF/ICF-CY core or code sets, including those previously mentioned, used the Delphi method for identifying relevant categories (Castro & Pinto, 2012;

Cieza, Chatterji et al., 2004; Cieza, Stucki, et al., 2004; Ellingsen, 2011; Geyh et al., 2004; Morita, Weigl, Schuh, & Stucki, 2006; Rowland et al., 2012; Stier-Jarmer et al., 2009; Yonsei University Center for Social Welfare Research & Samyook Rehabilitation Center, 2009). The Delphi survey method is a structured process of consensus building and is typically conducted in three rounds (Dalkey, 1969). In most studies on ICF/ICF-CY core or code sets, this procedure has helped reduce an initially long list of categories across up to three rounds. In each round, survey participants consisting of experts–doctors, special educators, therapists, parents, social workers, researchers, etc.–engage in discussion on the topic at hand through survey questionnaires, after which they are informed of their collective opinion and given the opportunity to change their opinions. The present study conducted up to the full three rounds of the Delphi process to derive the valid and reliable ICF-CY code sets for pupils with physical disabilities.

In summary, this study was conducted to develop three age-based ICF-CY code sets for pupils with physical disabilities by using the Delphi method. The reason this study attempted to derive code sets, as opposed to core sets, is that the results were specifically intended for use in special education services. Moreover, this study was conducted with only three school-age groups, excluding 0–2-year-old children, because education is compulsory only for children 3 years old and more in South Korea. Finally, to identify essential code sets for special education services for pupils with physical disabilities, this study followed the Delphi method, which has been utilized to great effect in previous research for the development of ICF/ICF-CY core/code sets. The following chapter will explain the specific process of developing the ICF-CY Code Sets for Pupils with Physical Disabilities.

3 Methodology

This study used a multiphase Delphi survey method to derive the three age-based code sets for pupils with physical disabilities. Through a series of e-mail surveys, the relevant indicators of functioning of pupils with physical disabilities were derived from the ICF-CY components. Participants were asked to score, on the basis of their own opinions, all second-level category codes from the Body Functions and Structures, Activities and Participation, and Environmental Factors components of the ICF-CY in terms of their relevance in describing the functioning of pupils with physical disabilities. Three rounds of questionnaires were administered to obtain a consensus, with the second and third survey rounds being designed according to the results of the previous rounds. Three final code sets were derived by the end of the third survey round.

This methodology chapter is divided into five sections: the first section (3.1) presents an overall description of the Delphi method. The second section (3.2) describes the study design for the Body Functions and Structures component. Next, section 3.3 describes the study designs for Activities and Participation as well as Environmental Factors components. Section 3.4 addresses the validity and reliability of this study. Finally, the last section (3.5) presents the ethical considerations.

3.1 Delphi Method

The Delphi method is a survey method used to obtain consensus from a group or groups of experts through iterative anonymous questionnaires (Dalkey, 1969; Linstone & Turoff, 2002). The objective of the Delphi method is achieving a consensus of experts to resolve a complex problem where available empirical evidence is not enough and consensus has not previously been reached (Lee, 2001; Linstone & Turoff, 1975). The Delphi survey method was originally developed by the RAND Corporation in the 1950s as a means for helping groups of experts reach a definite consensus (Dalkey, 1969; Linstone & Turoff, 2002). Although the use of collective knowledge was nothing new for problem solving, the Delphi method was an original approach that avoided common problems occurring in face-to-face brainstorming meetings, such as the "predisposition to be swayed by persuasively stated opinions of others" (Dalkey & Helmer, 1963, p. 459) and the challenge of gathering often geographically distant experts on a particular subject. Studies on the effectiveness of the Delphi method have shown

that the structure of the Delphic polling procedure produces more accurate group consensus than traditional face-to-face discussion (Dalkey, 1969; Graefe & Armstrong, 2011).

As a structured communication process, the Delphi method has four key features: anonymity, iteration, controlled feedback, and the statistical aggregation of group responses (Dalkey, 1969; Yousuf, 2007). First, anonymity is ensured by using formal questionnaires that contain no identifying information, allowing members of the group to express their opinions privately. Second, the iteration of the questionnaire over several rounds gives the individuals the opportunity to alter their opinions without fear of losing credibility. Third, through controlled feedback between each of the iterative questionnaires, each member of the group is notified of the opinions of anonymous colleagues; this feedback takes the form of a simple statistical summary of the group response, such as the means or other average values for items, in order to illustrate the degree of consensus. Moreover, members are given the chance to argue individual judgments that fall outside the majority opinion of the group, and these minority opinions are relayed to all members as feedback in the next round. This way, feedback includes the opinions and judgments of all group members, without any domination of a particular individual. On the final round, the group opinion is defined as the statistical mean of the experts' opinions. These four characteristics of the Delphi method help reduce the domination of opinionated individuals, irrelevant communication, group pressure for conformity, and individual biases in group discussion (Goodman, 1987; Powell, 2003).

There were three reasons why the Delphi method was selected for this study. First, most development studies on ICF/ICF-CY core/code sets have successfully used it (Castro & Pinto, 2012; Cieza, Stucki, et al., 2004; Ellingsen, 2011; Geyh et al., 2004; Morita et al., 2006; Rowland et al., 2012; Yonsei University Center for Social Welfare Research & Samyook Rehabilitation Center, 2009). Second, no previous studies have developed ICF-CY code or core sets specifically for Korean children. As a result of searching researches related to the ICF-CY from 2007 to 2012 in the two major databases in South Korea (RISS and DBPIA), only two studies related to the ICF-CY were found, and neither was connected with the development of code sets or core sets. The Delphi method is very suitable research method to obtain solution of a issue where available empirical evidence is short and consensus has not been reached yet (Lee, 2001). In terms of no empirical researches or consensus related to the ICF-CY code sets, the Delphi method was selected as a very suitable research method to reach a consensus on ICF-CY code sets appropriate for pupils with physical disabilities in

South Korea. Finally, it was also a significantly proper survey method for this study to derive a consensus from geographically dispersed experts in terms of economy of survey time and cost compared with face-to-face group meetings (Yousuf, 2007).

The study design was adapted from previous studies on ICF/ICF-CY code/core sets that had successfully used the Delphi method, as well as other studies that used the Delphi method in health and social sciences. This design, including the research instruments, data collection procedures (including sample selection), data analysis methods are outlined in the following subchapters: the subchapter 3.2 describes the methods specific to the Body Functions and Structures components; and the following subchapter 3.3 discusses the methods used to investigate the Activities and Participation and Environmental Factors components.

3.2 Body Functions & Structures

The Delphi method was used to reach a consensus on what codes in the Body Functions and Structures components of the ICF-CY are relevant for assessing the functioning of pupils with physical disabilities in three age groups (3–6 years old, 7–12 years old, and 13–18 years old). First, physiatrists were asked to answer the above question in an e-mail questionnaire survey. Unlike the typical multi-round Delphi survey, the Body Functions and Structures components was designed such that a consensus could be reached in only one round, because of the particularly low standard deviation (SD < 1.00) in opinion for these components among doctors participating in a previous study on the development of eight ICF core sets (including physical disabilities and cerebral palsy), funded by the Korea National Statistical Office in 2009 (Yonsei University Center for Social Welfare Research & Samyook Rehabilitation Center, 2009). The reason for this high consensus was likely that it was easier to judge which codes and categories from these components were relevant for specific types of disabilities, compared with the other components of the ICF such as Activities & Participation and Environmental Factors (Yonsei University Center for Social Welfare Research & Samyook Rehabilitation Center, 2009). Thus, the Body Functions and Structures section of this Delphi study conducted only a single round questionnaire survey. The following sections present the sampling procedure, the research instrument design, data collection, and data analysis for the Body Functions and Structures component.

3.2.1 Sampling Procedures

Participants for this study were selected using purposive sampling, a non-probability sampling method (Gall et al., 2007). The use of non-random sampling techniques is more suited to achieving research goals when using the Delphi method, compared with using a random sample of panelists representing the target population (Hasson, Keeney, & Mckenna, 2000). That is, to obtain valid and reliable results in a Delphi survey, it is important to carefully create a panel with individual experts who represent a specific discipline or field (Campbell, Shield, Rogers, & Gask, 2004). In the present study, experts were physiatrists with research experience in the ICF/ICF-CY, or who had clinical careers with children with physical disabilities (including cerebral palsy) for over 10 years.

There were two reasons why physiatrists were selected as expert participants. First, in a previous study on ICF core sets in South Korea, the core set codes for the Body Functions and Structures component for people with physical disabilities and cerebral palsy were derived from an expert panel composed of physiatrists (Yonsei University Center for Social Welfare Research & Samyook Rehabilitation Center, 2009). Second, for children with physical disabilities to be eligible for special education or social welfare services in South Korea, they must receive a medical assessment carried out by physiatrists who are experts in rehabilitation medicine, as laid out in the Welfare of Disabled Persons Act (MHW, 2012) and the ASEDP (MEST, 2007). For both reasons, this study selected physiatrists as representative expert panelists with adequate professional information on body functions and structures for children with physical disabilities.

Five physiatrists participated as members of the expert panel for deriving the code sets for Body Functions and Structures. The initial aim for the sample size in this study was to recruit 10 physiatrists meeting the above criteria; however, it was very difficult to recruit 10 eligible physiatrists. Moreover, within the previous ICF core set study in South Korea, some of the core sets of the Body Functions and Structures component were derived using a panel of less than 10 doctors (Yonsei University Center for Social Welfare Research & Samyook Rehabilitation Center, 2009). This may be due to the closed medical research culture, in which cooperative research is rarely carried out (Han, 2010). Thus, the final sample size was five physiatrists.

The five physiatrists who met the sample criteria were referred by Rehabilitation International Korea (RI-Korea) and the Korea Solidarity for the Human Rights of Disabled People with Brain Lesions (KSHB). The reasons why these two organizations were asked and selected as agencies for recruiting the sample were as follows. First, RI-Korea was considered the most representative organization of specialists in the rehabilitation field for persons with disabilities in Korea, and was also the Korean branch of Rehabilitation International (RI), which is an internationally representative organization of rehabilitation professionals, active in over 100 countries. In addition, the KSHB is a national organization representing people with brain lesions (including those with cerebral palsy), which has collaborative relationships with specialized hospitals for children with cerebral palsy; they were also in the midst of conducting their own project using the ICF-CY for children with cerebral palsy. Furthermore, this study was funded by the KSHB, meaning that it aided in the sampling process by paying for all research costs and recruiting numerous participants through company channels; this greatly expanded the range of possible participants compared with using the limited channels of an individual researcher.

The sampling process for Body Functions and Structures was conducted in three steps. First, the study aims and procedure were explained to the above two organizations, which were then asked to recommend physiatrists suitable for this study. Second, 10 physiatrists recommended by these organizations were contacted by both phone and e-mail, provided by the organizations, so that brief information about this study could be explained to them. Finally, 5 physiatrists who agreed to participate were sent official invitations to participate, consisting of a brief description of the study and a letter asking for their informed consent (See Appendix A). They were also each paid 250 NOK (50,000 KRW) as an honorarium for their participation.

3.2.2 Instrument Design

The present study used the ICF Delphi questionnaire for Body Functions and Structures, which was produced and verified by Yonsei University Center for Social Welfare Research and Samyook Rehabilitation Center (2009), through partial revising to suit the aim of this study. This Delphi questionnaire was first used in a national project for developing a standardized Korean disability classification, funded by the Korea National Statistical Office; it was first used to derive eight ICF core sets for eight disabilities, including various physical

disabilities and cerebral palsy. This questionnaire consists of second-level category codes from all components of the Korean version of the ICF (as the WHO recommends using second-level codes in research for educational or clinical objectives), which are well suited for describing particular cases (MHW, 2004). In this questionnaire, doctors were asked to rate the relative extent that each of the second-level codes in the Body Functions and Structures domain was relevant to the body functions and structures of people with specific disabilities. Because this was a closed-ended questionnaire, participants were asked to choose an answer from among a list provided by the researcher, each of which corresponded to a four-point Likert scale value (1 = "very relevant", 2 = "somewhat relevant", 3 = "slightly relevant", and 4 = "not relevant"). In other words, if participants thought that a particular code reflected a greatly impaired body structure or function in persons with that specific disability, they might select "very relevant"; conversely, if the code did not represent an impaired body structure or function in people with that disability, they might answer with "not relevant." This ICF questionnaire included the 119 codes for the Body Functions and Structures component of the ICF, except the "otherwise specified" codes (b/s□□8) and "unspecified" codes (b/s□□9), which designated body functions and structures that are somewhat unclear, such as "b399 Voice and speech functions, unspecified" and "b398 Voice and speech functions, otherwise specified."

In this study, the ICF Delphi questionnaire was adapted for use with the ICF-CY Body Functions and Structures; although for the most part it was the same questionnaire, it differed by adding the four second-level codes that reflect the developmental characteristics of children and youth in the ICF-CY that are not contained in the ICF. In other words, the ICF-CY Delphi questionnaire for Body Functions and Structures (See Appendix B) was a closed-ended questionnaire, with answers rated on a four-point Likert scale, containing a total of 123 codes. Physiatrists were asked to rate the degree that each code was relevant to the functioning of pupils with physical disabilities in each of the three age groups (3–5 years old, 6–12 years old, and 13–18 years old), using their experience and knowledge as specialists in rehabilitation medicine. A main difference in this questionnaire from the ICF Delphi questionnaire for adults was that physiatrists were asked to consider both the relative characteristics of physical disabilities and the general developmental features in each age group when they answered the questions. After incorporating advice from a supervisor for this thesis at the University of Oslo and a main researcher who had contributed to the development of the ICF Delphi questionnaire for the national project in South Korea, the draft

of the ICF-CY questionnaire was considered complete. Furthermore, the questionnaire was pretested by asking one of the five physiatrists on the way the questionnaire was structured and expressed. The final ICF-CY Delphi questionnaire was thus created by revising any awkward expressions or sentences according to the pre-test results.

3.2.3 Data Collection Procedure

By using the ICF-CY Delphi questionnaire, the data for the Body Functions and Structures components were collected by e-mail from participants between September 18 and October 8, 2012. After participants provided their written informed consent, they were sent three ICF-CY Delphi questionnaires on Body Functions and Structures for pupils with physical disabilities, one for each of the three age groups (3–5 years old, 6–12 years old, and 13–18 years old). Each participant was asked to rate all three age group questionnaires. Thus, a total of 15 questionnaires were collected from all five physiatrists by e-mail. Finally, physiatrists' responses were checked again for marking errors such as skipping questions or marking one question several times. If there were errors, the physiatrists who made the errors were asked to give their answer again via phone.

3.2.4 Data Analysis

Data were encoded and analyzed statistically using SPSS version 12.0. First, depending on the physiatrists' responses on how relevant each code in Body Functions and Structures was to the body functions and structures of pupils with physical disabilities, the data were encoded and input into a computer, with each item possessing a score between 1 and 4 (1 ="very relevant"; 2 = "somewhat relevant"; 3 ="slightly relevant"; and 4 = "not relevant") Descriptive statistics (means and SD) were calculated for each item (Gall et al., 2007). Thus, the data was calculated to show the degree of consensus for relevant items between physiatrists, with lower mean values reflecting more relevant items.

A cut-off mean value of 1.99 (50%) was used as the criterion for determining the most relevant codes for assessing and supporting the body functions and structures of pupils with physical disabilities. That is, the ICF-CY codes for the Body Functions and Structures components that had a mean value of 1.99 or less were included in the proposed code sets. Previous studies have used 50% cut-off points as a criterion of expert consensus for including particular codes in the final core or code sets (Cieza, Ewert et al., 2004; Ellingsen, 2011). In

sum, all codes that had a mean value of 1.99 and less were included in each of three ICF-CY age-based code sets (3–5 years old, 6–12 years old, and 13–18 years old).

3.3 Activities & Participation and Environmental Factors

A full three rounds of the Delphi survey were needed to reach a full consensus on which codes in the Activities and Participation and Environmental Factors components of the ICF-CY were relevant and appropriate for assessing the functioning and disability of pupils with physical disabilities in each age group. The first round of the Delphi survey asked participants how relevant each code was to the functioning of pupils with physical disabilities. The subsequent second and third rounds asked about the appropriateness of the codes selected from the previous round. According to the general rationale of the Delphi method, as mentioned above, the following sections outline the sampling procedure, research instruments, data collection, and data analysis for the three rounds.

3.3.1 Sampling Procedures

For examining the Activities and Participation and Environmental Factors components, 30 participants were selected as panel experts using purposive sampling (See Table 3.3). These 30 participants consisted of special educators, parents of pupils with physical disabilities, and special pedagogic professors. A ten-member panel was used for each age group, consisting of four parents, four special educators, and two special pedagogic professors. Ten members were used because Delphi studies typically recommend 10 to 15 experts per panel (Delbecq, Van de Ven, & Gustafson, 1975). To create each Delphi panel, parents were contacted through national organizations managed by parents so long as they met the following criteria: they had a child with physical disabilities in one of the corresponding age groups, and they had worked as a staff member in the national parents' organization. Special educators were selected from a local education office, special schools for pupils with physical disabilities, and a rehabilitation center according to two criteria: they had over five years of experience in a career related to special needs education (including working at a special school or rehabilitation center for pupils with physical disabilities in the each corresponding age group for this survey) and they had a master's degree in special education. The professors, whose main research topic was related to the education of pupils with physical disabilities, were recommended by the Korea Parents' Network for People with Disabilities (KPNPD) and the

KSHB. Both organizations had cooperative relationships with many of the special education professors for national or regional research projects on special education.

Table 3.3. *Makup and Referral Organizations of the ICF-CY Delphi Penal for Activities & Participation and Environmental Factors.*

Age	Position	Referral Organizations	N	
3–5	Parents	• Korean Parents Association for People with Severe or Multiple Cerebral Palsy • Daejeon Parents' Association for People with Cerebral Palsy	4	**10**
	Special Educators	• Incheon Metropolitan City Office of Education • Korea W School for Pupils with Physical Disabilities • Seoul J School for Pupils with Physical Disabilities • K Rehabilitation Centers for Persons with Physical Disabilities	4	
	Professors	• Korea Parents' Network for People with Disabilities • Korea Solidarity for the Human Rights of Disabled People with Brain Lesions	2	
6–12	Parents	• Korean Parents Association for People with Severe or Multiple Cerebral Palsy • Daejeon Parents' Network for People with Disabilities	4	**10**
	Special Educators	• Incheon Metropolitan City Office of Education • Korea W School for Pupils with Physical Disabilities • Seoul J School for Pupils with Physical Disabilities • Daejeon S School for Pupils with Physical Disabilities	4	
	Professors	• Korea Parents' Network for People with Disabilities • Korea Solidarity for Human Rights of Disabled People with Brain Lesions	2	
13–18	Parents	• Korean Parents Association for People with Severe or Multiple Cerebral Palsy • Daejeon Parents' Network for People with Disabilities	4	**10**
	Special Educators	• Korea W School for Pupils with Physical Disabilities • Seoul J School for Pupils with Physical Disabilities • M School for Pupils with Physical Disabilities • Jeju Y School for Pupils with Physical Disabilities	4	
	Professors	• Korea Parents' Network for People with Disabilities • Korea Solidarity for Human Rights of Disabled People with Brain Lesions	2	

It was important that parents were selected as experts along with the special educators and professors for the Activities and Participation and Environmental Factors components, because in everyday life situations, parents would serve as experts on how their children execute and participate in their own natural environments (Adolfsson 2011). Furthermore, compared with body functions and structures, activities and participation occur and can be observed in children's daily life environments; in turn, these daily life environments can also influence children's activities and participation (WHO, 2007).

The sampling process for the Activities and Participation and Environmental Factors components was in three steps. First, a brief explanation of the study aims was given to core staff members at the schools, parents' organizations, and the rehabilitation center. Once they understood the aims, the organizations were asked to recommend special educators, parents of pupils with physical disabilities, and special pedagogic professors who were suitable and

eligible for this study. Next, 35 specialists and parents referred by the organizations were contacted by phone and e-mail to give them an overview of the study. Furthermore, several face-to-face meetings with parent participants had to help them better understand the study. Finally, 30 panel members who agreed to participate were sent official research invitations consisting of a brief research description and an informed consent letter (See Appendix C). My efforts to maintain the sample after the first questionnaire will be explained in section 3.3.3.

3.3.2 Instrument Design

For Activities and Participation, and Environmental Factors, three-round Delphi questionnaires were designed as research instruments, with the second and third round questionnaires being built around an analysis of the responses to the previous questionnaire. The questionnaires were adapted from the ICF Delphi questionnaire, as the basic structure and content of each questionnaire was mostly similar to that of the ICF Delphi questionnaires developed by Yonsei University Center for Social Welfare Research and Samyook Rehabilitation Center in 2009.

The first round ICF-CY Delphi questionnaire for Activities, Participation, and Environmental Factors (See Appendix D) was developed by adding the 17 second-level codes reflecting the developmental characteristics of children and youth to the first round ICF Delphi questionnaire used in a previous study. In the round one survey, the questionnaire was administered to the three panels–each consisting of 10 members and corresponding to one of the three age groups–who rated the relative extent that each of the second-level codes in Activities, Participation, and Environmental Factors components was relevant to the capacity and performance of pupils with physical disabilities. As a closed-ended questionnaire, each item was scored on a four-point Likert-scale (1 = “very relevant,” 2 = “somewhat relevant,” 3 = “a slightly relevant,” and 4 = “not relevant”). For example, if a member of the 3–5 age group panel thought that a code for the Activities and Participation component could limit performance considerably in 3–5 year olds with physical disabilities, they could choose “very relevant”; in contrast, if the item could not limit performance at all, they might choose, “not relevant.” In the case of Environmental Factors, if a panel member for the 6–12 age group thought that a code for the Environmental Factors component would either considerably facilitate or hinder the performance of 6-12 year olds with physical disabilities, they might

deem the code “very relevant”; conversely, if the code did not at all facilitate or hinder performance, the panel member might select, “not relevant.”

The first round questionnaire was developed by excluding unspecified codes, incorporating advice from professors, and conducting pretests. The final first questionnaire included 145 second-level codes from the Activities, Participation, and Environmental Factors components of the ICF-CY, excluding the “otherwise specified” codes (d/e□□8) and “unspecified” codes (d/e□□9). Again, after incorporating advice from a supervisor for this thesis at the University of Oslo and a main researcher who had contributed to the development of the ICF Delphi questionnaire in South Korea, the draft of the questionnaire was considered complete. Eight parents and three teachers were asked to serve as pretesting experts to assess how the questionnaire was phrased before conducting the first round, after which I revised awkward expressions.

The second round survey consisted of only the codes where consensus was reached on the first survey, with an additional chance to suggest codes that had been excluded. Specifically, codes with means values of 2.99 (75%) or less on the first round survey were placed on the second round survey. A cut-off of 75% has been recommended as a criterion of expert consensus for the first and second round survey in previous studies (Yonsei University Center for Social Welfare Research & Samyook Rehabilitation Center, 2009). Moreover, codes that were eliminated in the second round because they were not considered relevant (having a value of 3.00 or over) were included in the minority comments section in the second round questionnaire. The minority comment section provide panel members with a chance to suggest the reason why the excluded codes should be included as relevant and appropriate codes if a participant thought like that. This is because the Delphi method recommends respecting minority opinion and protecting against excessive influence of the majority (Lee, 2001). Furthermore, the mean values for all codes on the first round were offered alongside the codes of the second round questionnaire in order to provide feedback on the degree of consensus between study participants in the first round. In summary, the second round questionnaires (See Appendix E) included the codes deemed relevant by the first round (according to a cut-off point of 75%) along with those that had not met the cut-off point to give participants a chance to suggest a minority comment on why the codes had to be included as relevant and appropriate.

In the round two survey, the three age-based panels were asked to rate the relative extent that each of the second round items/codes in Activities & Participation and Environmental Factors is appropriate as assessment items/codes to support special education services for pupils with physical disabilities in each corresponding age among three age groups (3-5, 6-12, 13-18 years old) based on their experience with and knowledge about the pupils. As a closed-ended questionnaire, the rating values of the appropriateness were given from one to four points as Likert-scale: “very appropriate” = 1 point, “somewhat appropriate” = 2 points, “slightly appropriate” = 3 points, “not appropriate” = 4 points. In addition, the panels were also asked to suggest a minority opinion on why the excluded codes with relevance mean value 3.00 or more should be included as relevant and appropriate codes in the last round-questionnaire if they thought relevant and appropriate, in the minority comment section of the second round-questionnaire.

The third round survey included the codes where consensus had been reached on the second survey, as well as the codes suggested why the excluded codes from first round survey must be included as the relevant and appropriate code to assessing functioning for pupils with physical disabilities in the minority comments section of the second-questionnaire. As with the second round, the mean cut-off value for each code in the second survey was determined to be 2.99 (75%). Thus, the third round questionnaire (See Appendix F) included codes with mean values of 2.99 and or less from the second survey, and any codes suggested in the minority comments section in the second round questionnaire were included. These codes suggested in the minority section were also asked for the participants to rate in the third round survey like the other codes with appropriateness mean value of 2.99 or less. Second round mean values were given alongside the codes to provide feedback, and the minority comments were also offered along with the each code to help judge for re-evaluating the suggested codes instead of the relevance mean values.

As with the second round questionnaire, the third round questionnaire asked the three age-based panels about the appropriateness of each code as assessment items/codes to support special education services for pupils with physical disabilities in each age group. Scores for each code were rated on a four-point Likert-scale, as with the second round.

3.3.3 Data Collection Procedures

Data collection for the Activities and Participation and Environmental Factors components was conducted in three steps. The study period was from September 18 to November 10, 2012. Questionnaires were administered through either e-mail or face-to-face meetings (only with parents). Face-to-face meetings were conducted to help parents in particular to understand the codes of the ICF-CY, because some terms might have been confusing to them (Ellingsen, 2011). First, all 30 panel members who agreed to participation and had returned their signed informed consent letter were sent the three ICF-CY Delphi questionnaires depending on what age group panel they were in. Each participant was then asked to fill in the questionnaire provided. Second, all 30 questionnaires were collected (response rate: 100%). Finally, participants' responses were checked again if they had made any marking errors. If there were errors, the respondents who made them were asked again to give their own answers about the questions by phone and then the errors were corrected according to this re-answering. These three steps were repeated in the second and third round surveys.

Sample retention is as important as sample recruitment for the Delphi methodology (Keeney, Hasson, & McKenna, 2006; Mullen 2003). For this reason, endeavors to maintain the sample participants included recruitment through authoritative organizations, providing an honorarium of 250 NOK (50,000 KRW) per participant, SMS and e-mail reminders, face-to-face meetings with participants, and a summary of the survey results between each data collection periods for each of the three rounds. Through these efforts, this study was able to achieve perfect sample retention for all three rounds.

3.3.4 Data Analysis

Data were encoded and analyzed statistically using SPSS 12.0 for all three rounds. After the first round data collection, data were encoded and input into a computer, with each code in the Activities and Participation and Environmental Factors components having a score between 1 and 4, depending on how panelists had rated the relevance of that code to the performance of pupils with physical disabilities. Descriptive statistics (means and SDs) were calculated for each item (Gall et al., 2007). In other words, each mean reflected the degree of consensus about the relevant codes between panelists, with lower mean values representing more relevant codes. After the first round data analysis, codes with mean values of 2.99 (75%) and

less were placed into the second round. Moreover, codes with means over 2.99 were placed in the minority comments section of the second round questionnaire.

The second round was analyzed in almost the same manner as the first: codes with mean values of 2.99 (75%) or less, were placed into the third round questionnaire. Furthermore, the minority opinion of excluded codes with low relevance was clarified into a short sentence, and then put into the third round questionnaire alongside the each suggested code. These codes with relevance mean values of over 2.99 as a first round result would also be rated the relative appropriateness the same as the codes with appropriateness mean values of 2.99 or less as a second round result, in the third round questionnaire.

Data analysis for the third round was similar to that in the first two rounds, but with a lower cut-off value, at 1.99 (50%) or less; any codes with more than 50% consensus were placed into the final code sets. Through this procedure, the final codes with mean values of 1.99 or less were included in each of the three ICF-CY age-based code sets for pupils with physical disabilities.

3.4 Reliability and Validity

This subchapter presents the general criteria for judging the reliability and validity of the Delphi survey compared with traditional surveys. That is, the aim of this subchapter is to offer a guideline for evaluating reliability and validity in this study. Specific discussions of the reliability and validity of the design and result will be described in Chapter 5.

3.4.1 Reliability

Reliability refers to the extent that research process can be repeated with the same results (Gall et al., 2007). The reliability in the Delphi methodology relies on the selection of experts, panel size, and the credibility of the procedure, from designing the questionnaires to the study design up until consensus is reached (Lilja, Laakso, & Palomki, 2011). First, the consensus results reached by using the Delphi process are only as reliable as the sample. Although the Delphi study appears to be a complicated survey, it is more a virtual panel discussion of experts, working much like any group decision-making process, which aims to answer a highly uncertain and speculative question. For this reason, samples selected randomly from the population of interest may not be thoroughly knowledgeable enough to answer the

questions exactly. Thus, contrary to a traditional survey, where the reliability of the results is statistically guaranteed through a large enough sample randomly selected from a target population, the reliability of the results of a Delphi survey is defined by the study participants. In other words, reliability increases when the sample experts are sufficiently knowledgeable and experienced to answer the speculative questions, as opposed to ensuring statistical power derived from a large sample size. To achieve this goal, experts should be recommended by colleagues or a third party capable of evaluating their expertise in the studied field, instead of depending on the researcher's own subjective judgment and evaluation (Lilja et al., 2011).

Second, participants in a Delphi survey are selected purposefully, meaning that there are no statistical criteria for determining a Delphi sample size; however, peer-reviewed journals recommended at least 10 panel participants (Keeney et al., 2006), although this number varies among researchers. Steward et al. (1999) suggested that anywhere from 7 to 100 experts are most suitable for a panel to receive sufficiently explanatory results. In contrast, Linstone and Turoff (2002) claim that large numbers of experts make the study more complex and have negative implications during field research; they suggest 5 to 10 panel members as the best number for achieving Delphi study goals. However, Ludwig (1997) claimed that panels of 3–5 experts are too small to be able to comprehensively respond to an issue; thus, they suggested that panels should consist of 10–20 experts. Meanwhile, Keeney et al. (2006) suggested that there should be at least 10 experts in a panel in order to obtain sufficiently descriptive results.

Third, reliability relating to the questionnaire process can be distilled into two aspects: (1) having a suitably credible questionnaire and (2) having a study design that faithfully follows that of the Delphi method. First, pretesting the questionnaire is a good way to ensure the reliability of the Delphi survey, much like in traditional surveys (Okoli & Pawlowski, 2004). Pretests allow the questionnaire to be tested on a trial sample so that the instrument can be fine-tuned (De Vaus, 2002). However, test-retest reliability (i.e., asking the same people the same questions at two different time periods and then calculating the correlation between the answers) is not relevant in Delphi surveys, compared with traditional surveys (Okoli & Pawlowski, 2004). This is because researchers expect participants to revise their responses across the several rounds of the Delphi survey. Regarding the survey design, the best way to increase reliability is to use well-tested questions from reputable questionnaires (De Vaus, 2002). Finally, in addition to the reliability of the questionnaire, in order to reach a reliable

consensus, the study design must incorporate the two key features of Delphi surveys: anonymity and iteration.

3.4.2 Validity

The validity–that the research is truly measuring what it is intending to measure (Gall et al., 2007)–of a Delphi survey can be broken down into two parts: the research instrument and the result. First, the validity of the research instrument refers to the extent to which the ICF-CY questionnaire accurately measures the constructs and contents it was intended to measure–in other words, that it consists of items that accurately measure how appropriate the ICF-CY codes are for assessing the functioning and disability of pupils with physical disabilities.

Next, the validity of the research results can be assessed in terms of the generalizability and causality of the study results. Generalizability is the extent to which the study results can generalize to similar situations or people. In Delphi studies, this can be ensured by choosing expert panelists who are sufficiently knowledgeable and experienced in answering highly speculative questions. Causality is the extent to which the results are explained by the factor or factors being considered, without the interference of another factor(s). In the present study, causality would be the extent to which the final codes can be interpreted or described within the three theoretical frameworks for this study (within-child factors, environmental factors, and time/developmental factors). Attrition is a significant factor contributing to low validity in Delphi studies (Ellingsen, 2011; Keeney et al., 2006). A response rate of at least 70% for each Delphi round is recommended to ensure adequate validity (Sumsion, 1998).

3.5 Ethical Considerations

If a study involves collecting data from human participants, researchers must pay attention to securing the privacy and confidentiality of all participants (Gall et al., 2007). Dalen (as cited in Petersmann, 2012) suggested three requirements to secure these ethical issues in a research: consent, information, and confidentiality. First, all the information and plan of this study, especially including ethical issues, were approved by the Norwegian Social Science Data Services (NSD) (See Appendix G) before fieldwork began. The procedure approved by the NSD made it necessary for participant recruitment to be done entirely via various related social and professional organizations, with initial contact being established through the

administrators of these networks. Furthermore, all ethical issues for this research with sample participants were discussed to them: that is, the confidentiality of the information, informed consent, the duration of participation, and their right to withdraw at any time during the survey process (Gall et al., 2007). Following this discussion, participants gave their oral and written consent, and received a signed, written version of all of the ethical issues to assure of them of their rights during participation (Gall et al., 2007). In order to ensure participants' confidentiality, the data were stored in my private computer and protected with a password so that no one could access the data without my knowledge. Moreover, all data were made anonymous by substituting participants' names for specific numbers.

4 Results

The Delphi method was found to be a very appropriate and effective way of deriving expert consensus on ICF-CY age-based code sets for pupils with physical disabilities. By using the Delphi procedure, this study were able to derive ICF-CY code sets that appeared to adequately assess the characteristics of physical disabilities along with the rapidly changing developmental and environmental characteristics of pupils of varying ages in the interactive approach as the theoretical and analytical framework for this study. That is, the iterative consensus process helped derive relevant and appropriate age-based code sets for pupils with physical disabilities on three levels: within-child, environmental, and developmental. This chapter begins by presenting an overview of the response rate and sample retention (4.1). The following two subchapters (4.2 and 4.3) describe the overall findings in the three assessed components (Body Functions and Structures, Activities and Participation, Environmental Factors), by the three levels (individual, environment, and development). The chapter concludes (4.4) by reporting the final ICF-CY code sets for students with physical disabilities in each component, and then comparing the similarities and differences in the codes of each age-based code set.

4.1 Response Rate

A total of 35 experts participated in this study. The response rates for the research began at 100% and remained at 100% throughout the subsequent rounds, as presented in Table 4.1.

Table 4.1. *Response Rates.*

Components	Round	Consented	Responded	Opt out	No response	Response Rate
Body Functions & Structures	Round 1	5	5	-	-	**100%**
Activities & Participation Environmental Factors	Round 1	30	30	-	-	**100%**
	Round 2	30	30	-	-	**100%**
	Round 3	30	30	-	-	**100%**

4.2 Body Functions & Structures

Physiatrists were asked to rate the relative degree of relevance between bodily and psychological impairments of pupils with physical disabilities and the codes of the Body Functions and Structures components. Eighty-three codes from Body Functions and 40 codes

from Body Structures were surveyed. Physiatrists were asked to consider all 83 items for each of the three age groups.

The numbers of codes in the final code sets in Body Functions tended to rise with age, while the number of codes in Body Structures was roughly similar among the three age groups. The 13–18-years code set had the highest percentage of Body Functions codes that were considered relevant (80%), while the 3–5-years code set had the lowest (52%). Sixty-three percent of the codes were selected as relevant in the 6–12-years code set. For Body Structures, all age groups had roughly 30% (approx. 12) of the codes retained. The numbers of relevant codes across each age group and the number of original codes in the components are presented in Table 4.2

Table 4.2. *Number of Items Rated as Relevant in Body Functions and Structures by Age Group.*

Components	Age Group	Total Items	Relevant Items
Body Function	3–5	83 (100%)	43 (52%)
	6–12	83 (100%)	52 (63%)
	13–18	83 (100%)	66 (80%)
Body Structure	3–5	40 (100%)	13 (33%)
	6–12	40 (100%)	12 (30%)
	13–18	40 (100%)	14 (35%)

In order to show, at a glance, the overall tendency of the findings for the Body Functions and Structures components (See Appendix H and Appendix I), the sum of the mean values of all second-level codes under each first-level category were transformed into the mean values of each first-level category by dividing the summed means of all second-level codes under each first-level category by the total number of second-level codes in each first-level category. The following two sections present the overall trend in the findings, with all values corresponding to the transformed first-level categories for physical disabilities and their accompanying developmental characteristics over time in each age group.

4.2.1 Body Functions

The codes for Body Functions reflected both the common characteristics of physical disabilities and the general developmental differences according to each age group. Table 4.3 presents the mean values of each of the first-level classifications. In the table, lower mean values represent more relevant codes.

A common feature among the first-level categories was that the codes reflecting the characteristics of physical disabilities were all very relevant (See Table 4.3). In particular, "b7 Neuromusculoskeletal and movement-related functions," "b1 Mental functions," and "b3 Voice and speech functions" were all highly relevant categories, with mean values much less than the 1.99, "b7 Neuromusculoskeletal and movement-related functions" showed the highest relevance, indicating that a major characteristic of physical disabilities is related to limitations in movement functions. In addition, "b1: mental functions" and "b3 Voice and speech functions" were the second and third highest categories, respectively. These two codes directly reflected the features of cerebral palsy: cerebral palsy can involve defects in not only mental functions (because cerebral palsy is directly caused by brain damage) but also voice and speech functions, owing to the muscle stiffness related to damaged nerves. In contrast, "b8 Functions of the skin and related structures" had no relevant codes, with a mean value of around 3 points, no doubt because skin functions are not related to physical disabilities or cerebral palsy. Therefore, all second-level codes of "b8 Functions of the skin and related structures" were not included in the final three code sets.

Developmental differences by each age group were verified according to the results of both "b6 Genitourinary and reproductive functions" and "b1 Mental functions" (See Table 4.3). "b6 Genitourinary and reproductive functions" was less relevant, with mean values centering around 3 points before 13 years of age; however, the relevance of it steeply increased to around 2.00–thus being somewhat relevant–in the 13–18-year-old age group. This result indicated that pupils with physical disabilities also followed a normal developmental path, with secondary sex characteristic emerging at approximately 13 years old. In addition, the relevance of "b1 Mental functions" rose with age. This is likely because higher-level mental functioning becomes socially more necessary as pupils age, rather than it being the result of a progressive impairment of mental functions with increasing age.

Table 4.3. *Results of the Delphi Survey for Body Functions (First-level Categories).*

	First Level Categories	**3–5** (N=5)	**6–12** (N=5)	**13–18** (N=5)
b1	Mental functions	1.82	1.41	1.38
b2	Sensory functions and pain	2.02	2.02	1.87
b3	Voice and speech functions	1.90	1.40	1.50
b4	Functions of the cardiovascular, haematological, immunological and respiratory systems	1.92	1.80	1.76
b5	Functions of the digestive, metabolic and endocrine systems	1.95	1.98	1.73
b6	Genitourinary and reproductive functions	3.03	2.63	2.00
b7	Neuromusculoskeletal and movement-related functions	1.26	1.15	1.15
b8	Functions of the skin and related structures	3.00	3.10	2.83
Total Mean		**1.82**	**1.80**	**1.67**

4.2.2 Body Structures

Like Body Functions, the codes in Body Structures reflected both the common characteristics of physical disabilities and the general developmental differences according to each age group. Furthermore, the findings of the Body Structures clearly showed the cause-and-effect relationship between Body Structures and Body Functions. Table 4.4 presents the means for the first-level categories. In the table, lower mean values represent more relevant codes.

In Body Structures, the characteristics of physical disabilities were all found to be highly relevant (See Table 4.4). High relevance was found for "s7 Structures related to movement," "s1 Structures of the nervous system," and "s3 Structures involved in voice and speech" in all age groups. The fact that "b7 Neuromusculoskeletal and movement-related functions" was highly relevant in Body Functions was likely connected with the high relevance of "s7 Structures related to movement" in Body Structures, as impairments in the latter would cause the impairments in the former in reality. Moreover, impairments in "s1 Structures of the nervous system" and "s3 Structures involved in voice and speech" were likely the causes of the limitations in "b1: mental functions" and "s3 Structures involved in voice and speech," which directly reflect the features of cerebral palsy. Finally, because "s8 Skin and related structures" had no relation to physical disabilities, much the same as "b8 Functions of the skin and related structures," all second-level codes in "s8 Skin and related structures" were excluded (all were higher than the cut-off point). In conclusion, these results showed that the Body Structures codes reflected the body structure impairments characteristic to physical disabilities, and were linked with Body Functions.

There were notable differences between age groups, as indicated by the increasing relevance of "s6 Structures related to the genitourinary and reproductive systems" (as with "b6 Genitourinary and reproductive functions" from 2.60 to 2.13 as age increased (See Table 4.4). This rise in relevance also supported the fact that pupils with physical disabilities still follow a normal developmental path in adolescence. However, the relevance of "s1 Structures of the nervous system" did not rise with age, unlike "b1 Mental functions." For "b1 Mental functions," the increasing relevance was likely due to higher mental functions becoming more necessary with increasing age, although these mental functions would develop more slowly in people with initial nervous system damage compared with the typically developing others, leading to impairment. In contrast, the lack of increase in "s1 Structures of the nervous system" likely is because physical impairments of the nervous system in the brain do not generally

worsen with increasing age, unless a pupil receives additional physical damage in a previously damaged area.

Table 4.4. *Result of the Delphi Survey for Body Structures (First-level Categories).*

First Level Categories		3–5 (N=5)	6–12 (N=5)	13–18 (N=5)
s1	Structures of the nervous system	1.68	1.96	1.88
s2	The eye, ear and related structures	2.60	2.47	2.50
s3	Structures involved in voice and speech	1.85	1.95	2.00
s4	Structures of the cardiovascular, immunological and respiratory systems	1.93	2.00	1.67
s5	Structures related to the digestive, metabolic and endocrine systems	3.13	3.00	2.88
s6	Structures related to the genitourinary and reproductive systems	2.60	2.47	2.13
s7	Structures related to movement	1.40	1.23	1.31
s8	Skin and related structures	3.30	3.35	3.20
Total Mean		**2.32**	**2.30**	**2,22**

4.3 Activities & Participation and Environmental Factors

Unlike Body Functions and Structures, which had only one survey round, the findings of the Activities and Participation, and Environmental Factors components were derived through three e-mail survey rounds.

A total of 96 codes from Activities & Participation and 64 codes from Environmental Factors were surveyed. By the third round, relevant codes in both components had reduced to around 36% to 64% of the original items, depending on the age group. The 6–12-years code set (63% of items) had the greatest number of relevant Activities & Participation codes, while the 3–5-years code set (36%) had the lowest number. Forty-four percent of the codes were selected as relevant for the 13–18-years code set. In Environmental Factors, the numbers of codes tended to increase with age. The 13–18-years code set (64% of original codes) had the greatest number of relevant codes in Environmental Factors, while the 3–5-years code set (23%) had the lowest number. Forty-one percent of the total items in Environmental Factors were selected as relevant for the 6–12 years item set. The numbers of codes across each age group selected in each of the three rounds, along with the original items, are presented in Table 4.5.

Table 4.5. *Comparison of Codes Retained in Each of the Three Data Collection Rounds.*

Components	Age Group	Total Items	1st Round	2nd Round	3rd Round
Activities & Participation	3–5	96 (100%)	46 (48%)	46 (48%)	35 (36%)
	6–12	96 (100%)	73 (76%)	71 (74%)	60 (63%)
	13–18	96 (100%)	73 (76%)	73 (76%)	42 (44%)
Environmental Factors	3–5	64 (100%)	42 (66%)	41 (64%)	23 (36%)
	6–12	64 (100%)	50 (78%)	49 (77%)	26 (41%)
	13–18	64 (100%)	53 (83%)	53 (83%)	41 (64%)

As with Body Functions and Structures, all values in the following sections were converted to the means of the first-level categories.

4.3.1 Activities & Participation

The first round survey results of Activities and Participation (See Appendix J) reflected the common characteristics of physical disabilities and the changes in general social experiences and developmental tasks between each age group over time. Tables 4.6 and 4.7 present the mean values of each first-level category for the first and third rounds, respectively. In each of the tables, lower mean values represent more relevant codes.

The first round survey well showed commonly shared characteristics of physical disabilities across all three age groups. In the first round, "d4 Mobility" and "d5 Self-care" both had high relevance across all ages. This is likely because pupils with physical disabilities will mainly experience restrictions in mobility and self-care, both of which require physical movement. Both "d3 Communication" and "d1 Learning and applying knowledge" were somewhat relevant, having mean values less than 3.00 across all age groups, correspond to the features of cerebral palsy. This is because cerebral palsy can involve brain damages and difficulties in vocalization and breathing, due to the muscles stiffness related to nerve damage, as seen in Body Functions and Structures.

In addition, the first round survey also reflected the childhood developmental characteristics and the social role or experience expected in each age group. First, in early childhood around three to five years old, the more simple tasks such as drinking, eating, and toileting in "d5 Self-care" were more relevant rather than relatively complex tasks such as scheduling or managing daily routine in "d2 General tasks and demands." In elementary school age from 6 to 12 years, "d1 learning and applying knowledge" were considered more relevant in their daily life activities compared with other age groups since it were socially expected that elementary school students built up basic learning skills such as writing, reading, calculating as an important developmental tasks. In adolescence, the daily life tasks in "d6 Domestic life" were considered as more relevant activities with relevance value less than 3.00 since the various activities of domestic life became more important as transitional tasks to prepare pupils for independent living in adulthood. This was also related to the beginning of transitional education that teaches basic living skills and vocational training for pupils with disabilities, which usually begins from 13 years old in Korean secondary schools. In terms of

the expansion of social experience or environment as getting older, “d7 Interpersonal interactions and relationships” and “d9 Community, social, and civic life” showed very slightly relevance in early childhood over 3.00, while these increased with age. This might be because relationships had widened from family members to friends and neighbors as age increasing like other pupils without disabilities. Conclusively, the first round results in Activities and Participation appeared pupils with physical disabilities had experienced the same developmental tasks and social role as pupils without disabilities regardless of presence of disabilities.

As described above, activities and participation of pupils with physical disabilities were likely to be constrained by the highly relevant “d4 Mobility” and “d5 Self-care” tasks, both of which are linked to movements across all age groups. On the other hand, they were also confronted with the same challenges in activities and participation that every pupil with or without disabilities commonly experienced due to change in social roles and developmental tasks expected in each period from early childhood to adolescence.

Table 4.6. *Result of 1st Delphi Round in Activities & Participation (1st-level Classification).*

First Level Classification Items		**3–5** (N=10)	**6–12** (N=10)	**13–18** (N=10)
d1	Learning and applying knowledge	2.82	2.10	2.50
d2	General tasks and demands	3.22	2.16	2.14
d3	Communication	2.75	2.50	2.38
d4	Mobility	1.89	1.58	1.75
d5	Self-care	2.41	1.36	1.48
d6	Domestic life	3.72	3.17	2.53
d7	Interpersonal interactions and relationships	3.13	2.64	2.90
d8	Major life areas	3.25	2.93	3.00
d9	Community, social and civic life	3.64	3.00	3.04
Total Mean		**2.84**	**2.30**	**2.40**

In both the second and third rounds, participants were asked how appropriate each code was for assessing functioning of pupils with physical disabilities in each age group to support special education services; second-level codes that were considered not appropriate–having means of 3.00 or over–in the second round were excluded from the third round survey. This was because codes that were deemed relevant and appropriate for each age group in the first and second rounds, respectively, were reinvestigated in the third round for appropriateness, and it would be difficult to directly compare the results of the third round (See Appendix K) with the results of the first round. Because the third round was only a resurveying of the codes that had already been regarded as relevant and appropriate in the previous two surveys, the

mean values in this round were generally lower than the mean values in the first round (See Table 4.7).

Both the "d4 Mobility" and "d5 Self-care" categories had mean values of less than 2.00 across all age groups in the third round, indicating that pupils with physical disabilities would mainly experience restrictions in mobility and self-care, as the results of the first round suggested (See Table 4.7). The third round results illustrate these codes would be clearly appropriate for assessing and supporting for pupils. Furthermore, all codes of "d6 Domestic life"–including cooking and household chores–were excluded from the final code set in the 3–5 age groups, because none of the codes were relevant or appropriate activities for children of this age. This result suggests that young children are not expected to be able to perform these activities due to their age, as opposed to their disability, as the codes were deemed appropriate for the other age groups. Thus, the final results for Activities and Participation reflected the differences in general social experiences and developmental tasks according to each age group very well.

Table 4.7. *Results of the Third Round for Delphi Survey in Activities and Participation (First-level Categories).*

First Level Categories		**3–5** (N=10)	**6–12** (N=10)	**13–18** (N=10)
d1	Learning and applying knowledge	1.92	1.47	2.23
d2	General tasks and demands	2.35	1.50	1.98
d3	Communication	1.89	2.20	2.27
d4	Mobility	1.53	1.41	1.05
d5	Self-care	1.62	1.16	1.14
d6	Domestic life	•	1.15	2.23
d7	Interpersonal interactions and relationships	2.13	2.50	2.36
d8	Major life areas	1.20	1.64	1.83
d9	Community, social and civic life	2.90	1.44	1.45
Total Mean		**1.80**	**2.00**	**1.85**

4.3.2 Environmental Factors

The first round survey results for Environmental Factors (See Appendix L) reflected the common characteristics of physical disabilities and each age group's general social experiences. Tables 4.8 and 4.9 present the mean values of the first-level categories in the first and third round surveys, respectively. In each table, lower mean values indicate more relevant and appropriate codes.

For the first survey, "e1 Products and technology" had the highest relevance value, indicating that pupils with physical disabilities would face physical obstacles in daily life, such as in entering buildings designed only for people without physical disabilities. The "e4 Attitudes"

and “e3 Support and relationships” categories also had high relevance for all ages. These results showed that the relationships with others and the attitudes of others on disability made quite an impact in the daily performance of people with physical disabilities.

Environmental factors tended to become more relevant with increasing age. This indicated that pupils with physical disabilities, with their growing social relationships and ever-expanding range of experiences that comes with age, gradually encountered a wider variety of environments, just as pupils without disabilities would. In particular, all environmental codes tended to be less relevant in the 3–5 years old age group, as compared with the older age groups, likely because the predominant environment for pupils in their early childhood is at home with parents and family members. In addition, this meant that they might encounter more environmental restrictions in their performance as they age, because of the physical, psychological, and social environmental barriers constructed around persons without disabilities in society.

Table 4.8. *First Round Results for Delphi Survey in Environmental Factors (First-level Categories).*

First Level Categories		**3–5** (N=10)	**6–12** (N=10)	**13–18** (N=10)
e1	Products and technology	2.30	1.76	1.68
e2	Natural environment and human-made changes to environment	3.02	2.75	2.86
e3	Support and relationships	2.54	2.25	1.93
e4	Attitudes	2.44	2.08	1.84
e5	Services, systems and policies	2.69	2.49	2.07
Total Mean		**2.60**	**2.28**	**2.07**

In the second and third rounds, participants were asked about the relative degree of appropriateness of the assessment items to support special education services for pupils with physical disabilities in each age so that 2nd-level items with low appropriateness, as mean value was more than 3.00 in the second round, were excluded in the third round survey items. Since items, which were refined as relevant and appropriate in each age group through the first and second rounds, were finally reinvestigated about appropriateness, it would be difficult to compare the results of the last Delphi round (See Appendix M) with the results of the first one directly. Due to resurvey about items already regarded relevant and appropriate in previous two surveys unlike the first round surveyed all items of Environmental Factors components, the mean of appropriateness in the third round was generally lower than the mean of relevance in the first round (See Table 4.8).

In the third round, “e1 Products and technology” had mean values of less than 2.00 for all age groups, indicating that pupils with physical disabilities mainly experienced barriers in their physical environments, as mentioned in the first round; thus, it would be necessary to determine what technology or aid devices they require. In addition, the appropriateness for “e3 Support and relationships” and “e4 Attitudes” was high. This meant that codes in these two categories should be assessed and supported to facilitate the performance of pupils with physical disabilities, because their relationships with others and others’ attitudes towards them would significantly affect their performance. Finally, “e2 Natural environment and human-made changes to the environment” displayed the lowest relevance for each age group. This might be because is it difficult for humans to change the surrounding environment, such as the climate, and natural disasters would be an extremely rare event in everyday life in South Korea; thus, it would not matter whether pupils would have disability during such disasters.

The third round results revealed that certain environmental factors tended to be more appropriate with increasing age. This means that pupils with physical disabilities would also gradually widen their social relationships and have more experiences as they age, much like pupils without disabilities. However, this would also suggest that they require more environmental support as they age, because they would be confronted with more environmental restrictions in their performance, stemming mainly from the physical, psychological, and social barriers constructed around persons with disabilities.

Table 4.9. *Third Round Results for Delphi Survey in Environmental Factors (First-level Categories).*

First Level Categories		**3–5** (N=10)	**6–12** (N=10)	**13–18** (N=10)
e1	Products and technology	1.42	1.36	1.24
e2	Natural environment and human-made changes to environment	2.86	2.81	1.92
e3	Support and relationships	1.69	1.59	1.40
e4	Attitudes	2.07	2.07	1.35
e5	Services, systems and policies	2.00	2.28	1.68
Total Mean		**1.94**	**2.00**	**1.50**

4.4 Final Code Sets

Table 4.10 shows the number of relevant and appropriate items in the final age-based code sets, divided by ICF-CY component. Less than three-fifths of the original 283 ICF-CY codes were retained–ranging from 40% to 58%–in total for the different age sets. The 13–18-years

code set retained the most items (58%) from the original survey, while the 3–5-years code set had the least number (40%).

Table 4.10. *Final Number of Items in the Code Sets and Percentage Retained*

	Body Functions (83)	Body Structure (40)	Activities & Participation (96)	Environmental Factors (64)	Total items (283)
3–5	43 (52%)	13 (33%)	35 (36%)	23 (36%)	114 (40%)
6–12	52 (63%)	12 (30%)	60 (63%)	26 (41%)	150 (53%)
13–18	66 (80%)	14 (35%)	42 (44%)	41 (64%)	163 (58%)

Sections 4.4.1–4.4.4 present the final ICF-CY code sets for students with physical disabilities (See Appendix N, Appendix O, and Appendix P) by dividing them into the Body Functions, Body Structures, Activities and Participation, and Environmental Factors components. Each section clearly shows the specific similarities and differences in the final codes across each age group by presenting tables of shared items across the age sets from the individual, environmental, and developmental perspectives.

4.4.1 Body Functions Code Sets

The codes corresponding to Body Functions in each final code set accurately reflected the common characteristics of physical disabilities and developmental characteristics of body functions specific to each age group (See Table 4.11). The "b7 Neuromusculoskeletal and movement-related functions" category was found to be highly relevant across all age groups, mainly because the codes in this category were the most common characteristics of physical disabilities: limitations in movement and mobility. In addition, a considerable number of codes from the "b1 Mental functions" category overlapped across the code sets, because a characteristic of cerebral palsy is brain damage. There were no codes from "b8 Functions of the skin and related structures" because since skin functions are not related to physical disabilities (including cerebral palsy). The number of codes retained in the Body Functions component also tended to increase with the age, likely due to the developmental delay caused by physical disability, which can continue from early childhood to adolescence. Another reason was that pupils are expected to have more complex functioning as they age due to the increase in activities. Table 4.11 shows that Body Functions codes tend to become more complex with increasing age; for example, "b164 Higher-level cognitive functions" is considered a complex function that appears to be relevant at about six years of age, compared with "b163 Basic cognitive functions," which is so simple that three-year-olds will also engage in it.

Table 4.11. *Age-based ICF-CY Code Sets in Body Functions*

Code	Category	3–5	6–12	13–18	Code	Category	3–5	6–12	13–18
b1 Mental functions									
b110	Consciousness functions	■	■	■	b147	Psychomotor functions	■	■	■
b114	Orientation functions	■	■	■	b152	Emotional functions	■	■	■
b117	Intellectual functions	■	■	■	b156	Perceptual functions	■	■	■
b122	Global psychosocial functions		■	■	b160	Thought functions	■	■	■
b125	Dispositions and intra-personal functions		■	■	b163	Basic cognitive functions	■	■	■
b126	Temperament and personality functions		■	■	b164	Higher-level cognitive functions		■	■
b130	Energy and drive functions		■	■	b167	Mental functions of language	■	■	■
b134	Sleep functions			■	b172	Calculation functions		■	■
b140	Attention functions	■	■	■	b176	Mental function of sequencing complex movements	■	■	■
b144	Memory functions	■	■	■	b180	Experience of self and time functions		■	■
b2 Sensory functions and pain									
b210	Seeing functions	■	■	■	b260	Proprioceptive function	■	■	■
b230	Hearing functions	■	■		b265	Touch function			■
b235	Vestibular functions	■		■	b270	Sensory functions related to temperature and other stimuli	■	■	■
b240	Sensations associated with hearing and vestibular function			■	b280	Sensation of pain		■	■
b3 Voice and speech functions									
b310	Voice functions	■	■	■	b330	Fluency and rhythm of speech functions	■	■	■
b320	Articulation functions	■	■	■	b340	Alternative vocalization functions			■
b4 Functions of the cardiovascular, haematological, immunological and respiratory systems									
b410	Heart functions	■	■	■	b455	Exercise tolerance functions		■	■
b440	Respiration functions	■	■	■	b460	Sensations associated with cardiovascular and respiratory functions		■	■
b445	Respiratory muscle functions	■	■	■					
b5 Functions of the digestive, metabolic and endocrine systems									
b510	Ingestion functions	■	■	■	b535	Sensations associated with the digestive system			■
b515	Digestive functions	■	■	■	b540	General metabolic functions			■
b520	Assimilation functions			■	b550	Thermoregulatory functions			■
b525	Defecation functions	■	■	■	b560	Growth maintenance functions	■	■	■
b530	Weight maintenance functions	■	■	■					
b6 Genitourinary and reproductive functions									
b620	Urination functions	■	■	■	b630	Sensations associated with urinary functions	■	■	■
b7 Neuromusculoskeletal and movement-related functions									
b710	Mobility of joint functions	■	■	■	b755	Involuntary movement reaction functions	■	■	■
b715	Stability of joint functions	■	■	■	b760	Control of voluntary movement functions	■	■	■
b720	Mobility of bone functions	■	■	■	b761	Spontaneous movements	■	■	■
b730	Muscle power functions	■	■	■	b765	Involuntary movement functions	■	■	■
b735	Muscle tone functions	■	■	■	b770	Gait pattern functions	■	■	■
b740	Muscle endurance functions	■	■	■	b780	Sensations related to muscles and movement functions	■	■	■
b750	Motor reflex functions	■	■	■					

4.4.2 Body Structures Code Sets

The retained codes corresponding to Body Structures also reflected the features of the physical disabilities and the developmental characteristics of body structures in comparison

with body functions (See Table 4.12). The code "s7 Structures related to movement" were found to be common across all three age groups, indicating that a major feature of physical disabilities was impaired movement. Furthermore, because physical impairments in body structures generally do not worsen with increasing age unless additional physical damage is sustained, meaning that the number of Body Structures codes did not significantly increase with age, unlike in Body Functions. All items of the "s8 Skin and related structures" category were excluded because the skin is not related to physical disabilities.

Table 4.12. *Age-based ICF-CY Code Sets in Body Structures.*

Code	Category	3–5	6–12	13–18	Code	Category	3–5	6–12	13–18
s1 Structures of the nervous system									
s110	Structure of brain	■	■	■	s130	Structure of meninges	■		
s120	Spinal cord and related structures	■	■	■					
s3 Structures involved in voice and speech									
s320	Structure of mouth	■	■	■	s340	Structure of larynx	■		
s4 Structures of the cardiovascular, immunological and respiratory systems									
s410	Structure of cardiovascular system	■	■	■	s430	Structure of respiratory system	■	■	■
s420	Structure of immune system			■					
s6 Structures related to the genitourinary and reproductive systems									
s610	Structure of urinary system			■					
s7 Structures related to movement									
s710	Structure of head and neck region	■	■	■	s750	Structure of lower extremity	■	■	■
s720	Structure of shoulder region	■	■	■	s760	Structure of trunk		■	■
s730	Structure of upper extremity	■	■	■	s770	Additional musculoskeletal structures related to movement	■	■	■
s740	Structure of pelvic region	■	■	■					

4.4.3 Activities and Participation Code Sets

The final code sets of the Activities and Participation component illustrated the common characteristics of physical disabilities and the differences in general social experiences and expectancies according to each age group (See Table 4.13). Numerous codes for the "d4 Mobility" and "d5 Self-care" categories were shared across all three age groups, illustrating, as with the previous two sections, that the main characteristics of physical disabilities were related to limitations in movement. Furthermore, the 3–5-years code set contained mainly basic activities and social experiences, such as pre-talking, watching, and imitating. In contrast, the 6-12-years code set, which was for pupils in elementary school, contained eighteen codes in "d1 Learning and applying knowledge," compared with nine in the 3–5 age group and six in the 13–18 age group. The low number of codes reflecting academic skills in the 13–18 years could be because the transitional skills for preparing for adulthood are more appropriate for this age, including vocational training, doing housework, and apprenticeships.

Therefore, the code sets were considered to accurately reflect the characteristics of physical disabilities and the age-specific social experiences and roles.

Table 4.13. *Age-based ICF-CY Code Sets in Activities and Participation*

Code	Category	3–5	6–12	13–18	Code	Category	3–5	6–12	13–18
d1 Learning and applying knowledge									
d110	Watching	■	■		d140	Learning to read		■	
d115	Listening	■	■		d145	Learning to write		■	■
d120	Other purposeful sensing	■	■		d150	Learning to calculate		■	
d130	Copying	■	■	■	d155	Acquiring skills	■	■	■
d131	Learning through actions with objects	■	■	■	d160	Focusing attention	■	■	
d132	Acquiring information	■	■	■	d161	Directing attention	■	■	
d133	Acquiring language	■	■		d166	Reading		■	
d135	Rehearsing		■		d170	Writing		■	■
d137	Acquiring concepts		■		d172	Calculating		■	
d2 General tasks and demands									
d210	Undertaking a single task	■	■	■	d230	Carrying out daily routine		■	■
d3 Communication									
d310	Communicating with - receiving - spoken messages	■	■		d332	Singing		■	
d315	Communicating with - receiving - nonverbal messages	■	■		d335	Producing nonverbal messages	■	■	■
d325	Communicating with - receiving - written messages		■		d345	Writing messages		■	■
d330	Speaking		■		d350	Conversation		■	■
d331	Pre-talking	■	■		d360	Using communication devices and techniques		■	■
d4 Mobility									
d410	Changing basic body position	■	■	■	d446	Fine foot use		■	■
d415	Maintaining a body position	■	■	■	d450	Walking	■	■	■
d420	Transferring oneself	■	■	■	d455	Moving around	■	■	■
d430	Lifting and carrying objects	■	■	■	d460	Moving around in different locations	■	■	■
d435	Moving objects with lower extremities	■	■	■	d465	Moving around using equipment	■	■	■
d440	Fine hand use	■	■	■	d470	Using transportation			■
d445	Hand and arm use	■	■	■					
d5 Self-care									
d510	Washing oneself	■	■	■	d550	Eating	■	■	■
d520	Caring for body parts		■	■	d560	Drinking	■	■	■
d530	Toileting	■	■	■	d570	Looking after one's health		■	■
d540	Dressing		■	■	d571	Looking after one's safety		■	■
d6 Domestic life									
d640	Doing housework			■					
d7 Interpersonal interactions and relationships									
d710	Basic interpersonal interactions	■	■		d750	Informal social relationships		■	
d730	Relating with strangers		■		d760	Family relationships		■	
d8 Major life areas									
d810	Informal education	■	■		d835	School life and related activities		■	
d815	Preschool education	■			d840	Apprenticeship (work preparation)			■
d816	Preschool life and related activities	■			d855	Non-remunerative employment			■
d820	School education		■	■	d860	Basic economic transactions		■	
d825	Vocational training			■	d880	Engagement in play	■	■	■
d9 Community, social and civic life									
d920	Recreation and leisure		■	■	d940	Human rights			■

4.4.4 Environmental Factors Code Sets

The code corresponding to Environmental Factors suitably reflected the characteristics of physical disabilities and age-specific social experiences and roles (See Table 4.14). Most codes in the "e1 Products and technology" category overlapped between age groups; that is, regardless of age, pupils with physical disabilities would face physical obstacles in the pursuit of daily goals, such as buildings designed only for people without physical disabilities. The fact that these codes are relevant and appropriate indicates that products and buildings designed for those with disabilities are necessary for appropriately supporting pupils with physical disabilities. There were five overlapping codes in "e4: attitudes" and four in "e3 Support and relationships," indicating that relationships with others and the attitudes of others towards disability would influence daily performance in pupils with disabilities. Most of the codes in "e2 Natural environment and human-made changes to the environment" were excluded from the code sets because the natural environment–such as weather conditions–can only be controlled to some degree, and disasters were very rare events that were completely unrelated to everyday life in South Korea. The mean values for all Environmental Factors codes increased with advancing years. This might be because the social experiences and life areas of pupils with physical disabilities gradually expand from their homes to different schools and the larger community, much like pupils without disabilities. However, with this expanding environment, they would face more obstacles because the wider social environment tends to be constructed around persons without disabilities; thus, they would need more environmental support as they age, which would explain the increasing appropriateness.

Table 4.14. *Age-based ICF-CY Code Sets in Environmental Factors*

Code	Category	3–5	6–12	13–18	Code	Category	3–5	6–12	13–18
e1 Products and technology									
e110	Products or substances for personal consumption	■	■	■	e140	Products and technology for culture, recreation and sport	■	■	■
e115	Products and technology for personal use in daily living	■	■	■	e150	Design, construction and building products and technology of buildings for public use	■	■	■
e120	Products and technology for personal indoor and outdoor mobility and transportation	■	■	■	e155	Design, construction and building products and technology of buildings for private use	■	■	■
e125	Products and technology for communication	■	■	■	e160	Products and technology of land development		■	■
e130	Products and technology for education	■	■	■					
e2 Natural environment and human-made changes to environment									
e210	Physical geography			■	e260	Air quality			■
e250	Sound		■						
e3 Support and relationships									
e310	Immediate family	■	■	■	e340	Personal care providers and personal assistants	■	■	■
e315	Extended family	■	■	■	e345	Strangers			■

Code	Category	3–5	6–12	13–18	Code	Category	3–5	6–12	13–18
e320	Friends				e355	Health professionals			
e325	Acquaintances, peers, colleagues, neighbours and community members				e360	Other professionals			
e330	People in positions of authority								
e4 Attitudes									
e410	Individual attitudes of immediate family members				e445	Individual attitudes of strangers			
e415	Individual attitudes of extended family members				e450	Individual attitudes of health professionals			
e420	Individual attitudes of friends				e455	Individual attitudes of other professionals			
e425	Individual attitudes of acquaintances, peers, colleagues, neighbours and community members				e460	Societal attitudes			
e440	Individual attitudes of personal care providers and personal assistants								
e5 Services, systems and policies									
e510	Services, systems and policies for the production of consumer goods				e555	Associations and organizational services, systems and policies			
e515	Architecture and construction services, systems and policies				e560	Media services, systems and policies			
e520	Open space planning services, systems and policies				e570	Social security services, systems and policies			
e525	Housing services, systems and policies				e575	General social support services, systems and policies			
e540	Transportation services, systems and policies				e580	Health services, systems and policies			
e550	Legal services, systems and policies				e585	Education and training services, systems and policies			

In summary, three age-based ICF-CY code sets containing the most relevant and appropriate codes for assessing the functioning of pupils with physical disabilities were derived by using the Delphi method. This Results chapter showed the overall tendency and specific items of this study finding with the similarities and differences between the final code set items across the three age groups in the interactive perspective to childhood disability. The final chapter of this thesis will discuss the validity and reliability of the findings and study design, as well as the implications of this study, including the limitations, contributions, and future directions.

5 Discussion, Implication, and Conclusion

The purpose of this study was to derive age-based code sets from the ICF-CY for use in special education services. These code sets were intended to facilitate interdisciplinary collaboration between experts, as well as between specialists and parents, in South Korea. The Delphi method was utilized to achieve consensus from nationally representative experts from a range of disciplines through iterative rounds of an e-mail questionnaire. The present study found that the ICF-CY categories could be organized into essential code sets by age group that reflect the general characteristics of physical disabilities and developmental stages–as well as the environmental factors that influence the latter two components–in pupils with physical disabilities. These experts were recommended by 11 nationwide organizations for persons with disabilities, reaching a total sample size of 35 experts that consisted of physiatrists, parents, special educators, and special pedagogical professors.

This chapter begins with a review of the measures taken to ensure the credibility of the results, followed by a discussion of the reliability and content validity of the findings (5.1). The discussion of the content validity presents the overall similarities and differences between the final code sets by age group to show their consistency with the three aspects of the interactive model of disability (within-child, developmental, and environmental features changing over time). Section 5.2 discusses the limitations of this research and presents the contributions of this study to special education services. This section also suggests directions for future research to maximize the study contributions and to reduce the limitations. Finally, this chapter concludes overall summary of this study (5.3).

5.1 Reliability and Validity of Findings

As discussed in Chapter 3, the reliability and validity of this study depended on the following: study procedure for consensus, selection of expert sample, sample panel size, sample retention, and the content validity of the questionnaire and findings. Thus, this subchapter first describes how the Delphi method is the most credible method for deriving code sets (5.1.1), and then presents the endeavors taken to ensure that the study procedure had good reliability and validity. Then, section 5.1.2 discusses the efforts taken in the sample selection and retention to achieve reliable results in this study. This subchapter concludes with a discussion of the content validity of the findings, including the questionnaire (5.1.3).

5.1.1 Study Design

The Delphi method is well-validated method for gathering evidence from expert panels within a topic of interest and for reaching a consensus in this group of experts (Biondo, Nekolaichuk, Stiles, Fainsinger, & Hagen, 2008). For this reason, most studies aiming to derive ICF/ICF-CY core or code sets have used the Delphi method for identifying essential codes for assessment (Ellingsen, 2011; Yonsei University Center for Social Welfare Research & Samyook Rehabilitation Center, 2009). Thus, this study used the Delphi method to derive the ICF-CY code sets for pupils with physical disabilities.

When using the Delphi method, the validity and reliability of the study design can be ensured by using a reliable questionnaire (De Vaus, 2002) and conducting the study according to the key characteristics of the Delphi method: anonymity and iteration (Okoli & Pawlowski, 2004). Regarding the reliability of the questionnaire, this study used well-tested questionnaires adapted from the ICF Delphi questionnaire that was originally created to develop Korean ICF core sets for eight types of disabilities, as part of a national project of the Korea National Statistical Office by Yonsei University Center for Social Welfare Research and Samyook Rehabilitation Center (2009). Moreover, the draft of the questionnaire for this study was completed by integrating advice from a supervisor for this thesis at the University of Oslo and a principle researcher who had contributed to the development of the ICF Delphi questionnaire for the national project in South Korea. Finally, the phrasing of the questionnaire was corrected through pretests with one physiatrist, eight parents, and three teachers from the participants.

In addition, the study design included three anonymous iterations of one version of the questionnaire survey. By conducting a series of three iterative e-mail questionnaires, a high level of consensus was obtained on the most relevant and appropriate items for assessing the functioning of pupils with physical disabilities across the three studied age groups. Moreover, expert respondents were always anonymous, with each possessing an individual number instead of name. This anonymity helped participants freely admit their own opinions without being influenced by majority opinions. The above three strategies (reliable questionnaire, iterative rounds, and anonymity) contributed to the creation of three reliable and valid code sets.

5.1.2 Reliability of Results

The reliability of the results of a Delphi study absolutely depends on the representativeness of expert participants (Ellingsen, 2011). In order to secure such representative experts, the Delphi method emphasizes recruitment of panelists who are recommended by a third party adequately suited for evaluating expertise in the chosen field (Lilja et al., 2011). One of the most outstanding aspects of this research was that it contained experts recruited through authoritative organizations for people with disabilities across South Korea. This study was funded by the KSHB, which has not only a nationwide network of people with brain lesions, including those with cerebral palsy but also has cooperative relationships with numerous and diverse national rehabilitation and human rights organizations for people with disabilities in South Korea. Because the KSHB was conducting its own nationwide project relating to the ICF/ICF-CY for people with physical disabilities, this study, as a part of this national project, could utilize the resources and collaborative networks of the KSHB along with those of numerous other rehabilitation and human rights organizations for people with disabilities. For example, the KSHB helped connect with the relevant organizations for recruiting participants for this study, recruited the participants in the name of the organization, and paid the honorarium about NOK 250 (50,000 KRW) for participation to each participant. Owing to this aid, this study was able to recruit sample experts who were sufficiently knowledgeable and experienced for this study. The referral organization and the number of participants are listed below in Table 5.1.

Table 5.1. *Delphi Panel Configuration and Referral Organizations*

Components	Position	Referral Organizations	Age	Numbers
Body Functions & Structures	Physiatrists	• Rehabilitation International Korea • Korea Solidarity for Human Rights of Disabled People with Brain Lesions	3–5 6–12 13–18	**5**
Activities & Participation Environmental Factors	Parents	• Korean Parents Association for People with Severe or Multiple Cerebral Palsy • Daejeon Parents' Association for people with Cerebral Palsy	3–5	**10**
	Special Educators	• Incheon Metropolitan City Office of Education • Korea W School for Pupils with Physical Disabilities • Seoul J School for Pupils with Physical Disabilities • K Rehabilitation Centers for Persons with Physical Disabilities • Daejeon S School for Pupils with Physical Disabilities • M School for Pupils with Physical Disabilities • Jeju Y School for Pupils with Physical Disabilities	6–12 13–18	**10** **10**
	Professors	• Korea Parents' Network for People with Disabilities • Korea Solidarity for Human Rights of Disabled People with Brain Lesions		

Contrary to traditional survey methods, where sample size is important for determining the statistical generalizability of results, the sample size in the Delphi method plays little part in determining the reliability of the results; thus, there are no set criteria for deciding on the

sample size of a Delphi study. However, previous studies have recommended at least 10 participants per panel (Keeney et al., 2006; Okoli & Pawlowski, 2004). As such, most of the panels in this study were composed of 10 expert members (See Table 5.1), with the exception of Body Functions and Structures. In Body Functions and Structures, the initial aim was to recruit 10 physiatrists who met the above criteria for expertise, but it became too difficult to recruit 10 physiatrists with such expertise. This might be due in part to the closed medical research culture in South Korea, in which cooperative research is rarely carried out (Han, 2010). Thus, the final sample size for this component was five physiatrists; this limitation of sample size in Body Functions and Structures will be discussed again in the limitations section (5.2).

5.1.3 Content Validity

In this study, the main validity concerns were for the instruments and results. The validity of the instrument is related to the structure and content of the questionnaire, and the validity of the results is determined by the representativeness of the sampled experts, sample retention, and the content validity of the findings. In order to generalize the results, this study not only recruited sample experts who were sufficiently knowledgeable and experienced according to strict criteria as mentioned above (5.1.1) but also retained 100% of its participants across all rounds of the Delphi surveys. Furthermore, it would be important to consider the construct and content validity of the questionnaire, as well as the content validity of the findings, that is, how well the content of the ICF-CY Delphi questionnaire encompassed all the characteristics and developmental and environmental factors of pupils with disability, and whether it accurately portrayed these characteristics. Furthermore, validity was determined by how well the results of the Delphi survey reflect the interactive approach to childhood disability (including within-child characteristics of physical disability, general developmental changes, and environmental transitions over time), which is the fundamental framework of the ICF-CY and the analytical framework for this study.

Regarding the content and construct of the study questionnaire, the ICF-CY proper has been validated by numerous international and multidisciplinary expert groups. In order to develop the ICF-CY, multidisciplinary scholars in 23 countries collaborated to identify the valid and universal concepts and factors reflecting childhood functioning and disability (McLeod & Threats, 2008). Moreover, the draft of the ICF-CY was extensively field tested by

multidisciplinary specialists in Italy, Japan, Sweden, the USA, and Sudan (McLeod & Threats, 2008). Through these field tests, the ICF-CY was determined to have good reliability and validity for assessing childhood functioning and disability (Ibragimova et al., 2005). Thus, by directly basing my own questionnaire on the ICF-CY, the content and construct validity of the questionnaire was ensured.

A review of the particular codes for each of the three code sets shows that the interactive approach to childhood disability was generally supported; the three key factors of the interactive model–the within-child characteristics of physical disability, general developmental changes in these characteristics, and environmental transitions as children age–were reflected in the chosen codes. First, the codes that were common across all age groups appropriately reflect the common features of physical disabilities, including cerebral palsy. Most of these shared codes were linked to limitations in movement functions, which are the main characteristics of physical disability, as well as mental function impairments, which are caused by the characteristic brain damage of cerebral palsy. These codes, expressed in terms of their first-level categories, included: "b7 Neuromusculoskeletal and movement-related functions," "s7 Structures related to movement," and "b1 Mental functions" in the Body Functions and Structures domain; "d4: mobility," "d5 Self-care," and "d1 Learning and applying knowledge" in the Activities and Participation component; and "e1 Products and technology" in Environmental Factors. These results were almost the same as the core set items for physical disability and cerebral palsy (or brain lesions) derived from the national study for developing ICF core sets in South Korea (Yonsei University Center for Social Welfare Research & Samyook Rehabilitation Center, 2009). Because most of the shared codes across the age groups were related to the codes found in the ICF core sets, the main characteristics of physical disabilities were properly reflected in the findings of this study. However, these characteristics are not fixed, and must be comprehended as flexible features that interact with various intrinsic and extrinsic factors (Warnock & Norwich, 2010).

The main differences in code set items between age groups reflected the various differences in developmental expectations and activities, as well as social environments, from early childhood (preschool age: 3–5 years old) to childhood (elementary school age: 6–12 years old) to adolescence (secondary school age: 13–18 years old). In the Body Functions and Structures component, the number of retained codes tended to increase with age in the Body Functions component, while that number in Body Structures did not. Furthermore, code items of

relatively lower body function tended to remain in each age code set compared with body function code items in the "ICF-CY Developmental Code Sets", which were age-based reduced item code sets to describe child functioning and development for all child with or without (Ellingsen, 2011). This reason might be that the developmental delay caused by physical disabilities would remain consistent across early childhood and adolescence, while at the same time, a higher level of body functions were expected with advancing years. Vygotsky (1993) insisted that social and cultural environments designed around only people without disabilities might delay the development of children with disabilities. However, more complex body functions codes would still emerge with age in pupils with disabilities, much the same as in pupils without disabilities. For example, "b164: higher-level cognitive functions" is a more complex function, and was present in only the two older code sets, whereas "b163: basic cognitive functions" was a simple function, and found in only the youngest code set. Vygotsky (1993) also argued that children with disabilities could better compensate for their disability if they have suitably adapted social and cultural environments. Next, in the Body Structures component, the number of codes was mostly similar across the three age groups. This might be because body structures are biological parts, while body functions have psychological aspects, such as mental functions (WHO, 2007): because they are often socially bound, the psychological functions of children can either be enhanced or reduced depending on the interaction between children and their social environments (Vygotsky, 1993); however, body structures, being biologically bound, will not tend to overtly change or decrease in functioning with increasing age during childhood and adolescence, unless additional physical damage is sustained in already damaged areas. Thus, because the final code sets in Body Functions and Structures accurately reflect these differences in psychological and biological development, the number of Body Structure codes would not increase much across the three age groups, even when the number of Body Function codes directly increased.

Similar with Body Functions, both the functional level and number of codes in Activities and Participation increased with age. The code set for the 3–5 years age group comprised mainly relatively basic and simple activities and participation codes, such as pre-talking, watching, and copying. In addition, the number of codes in "d1: learning and applying knowledge" dramatically increased from the 3–5 years age group (preschool-age) to the 6–12 years age group. This increase appears to support Jean Piaget's development theory of childhood, in which higher stages of development emerge with increasing age (Piaget & Inhelder, 1969;

2000). In comparison, the number of "d1: learning and applying knowledge" codes in the 13–18-years code set was lower than that of the 6–12-years code set, perhaps because codes related to skills and activities that helped prepare pupils for adulthood were considered more relevant for the older age group. Such codes included vocational training, doing housework, and apprenticeships. This tendency appears to reflect the developmental characteristics of adolescence, whereby adolescence is a transitional period between children and adulthood, and much of it consists of preparing children to function in adult roles (Larson & Wilson, 2004). Furthermore, these code items might reflect the social and educational environment for pupils with disabilities in South Korea, which focuses on transitional education–such as vocational training in secondary school for independent living in adulthood–rather than academic skills (KNISE, 2010). Therefore, the code sets for the Activities and Participation component also appear to include the interactive characteristics of within-child development over time.

Finally, the Environmental Factors component appeared to reflect the developmental characteristics and social environment changes within a specific period. First, the codes of the "e4: attitudes" and "e3: support and relationships" categories in each age group were both relevant and appropriate for pupils with physical disabilities, and both the relevance and appropriateness appeared to increase with age. This means that these categories–which refer to the attitudes of other individuals on disability and pupils' relationships with others, respectively–significantly influenced pupils' daily performance. Because individuals get to know themselves through their interactions with others in society (Mead, 1982), and the emotional experiences of others directly influences individuals' daily living and academic performance (Mahn & John-Steiner, 2002; Vygotsky, 1994), both social relationships and others' attitudes about pupils with physical disabilities are very important, not just to maintain pupils' self-esteem, but also to help them actively participate in daily and school life. Moreover, feelings of inferiority, caused by the stigma of physical disability in society, may present secondary barriers to proper psychosocial development (Vygotsky, 1993). Adolescence is a critical period in the formation of identity, and most adolescents tend to place considerable importance on their relationships with their peer group (Erikson, 1980). Second, the number codes of the Environmental Factors component increased with age: this reflects how social experience and environment of pupils with physical disabilities gradually extends from beyond the home to schools and the wider community, as with children without disabilities. However, pupils with disabilities do face more obstacles in their social

environments, which tend to be constructed around persons without disabilities (Priestley, 2003). In this respect, the gradually increasing number of codes in Environmental Factors accurately reflected the differences in the general characteristics of development and the social experiences between each age group.

5.2 Limitations and Future Directions

Despite its numerous contributions to the field, this study also has some limitations, mainly related to the validity, such as a lack of physiatrist participants and no additional validation survey. Nevertheless, this study will contribute to resolving the problem related to using the medical model in assessing pupils for special education services, by supporting the more effective interactive model. However, to fully realize this main contribution, further studies would have to be conducted applying the ICF-CY Code Sets for Pupils with Physical Disabilities in actual assessment settings. The particular limitations and contributions of this study, as well as future directions, are discussed in detail below (5.2.1, 5.2.2, and 5.2.3, respectively).

5.2.1 Study Limitations

The results of the Body Functions and Structures components may have been more generalizable had more physiatrists been recruited. Because the Delphi method uses purposive sampling, there are no standards or statistical criteria for determining sample size, although previous studies have recommended at least 10 participants per panel to obtain suitably valid results (Keeney et al., 2006). Only five physiatrists were recruited as panelists for Body Functions and Structures, unlike the 10 for each panel in Activities and Participation and Environmental Factors. This small sample size might be due to the closed medical research culture in South Korea, in which cooperative research is rarely carried out (Han, 2010), and perhaps due to limitations in research budget and period . Thus, further studies investigating ICF-CY code sets could conduct joint research with a medical organization for a much longer period and with enough funding to improve the sample size of the panels, making the results more generalizable.

Furthermore, the final code sets were not validated through focus group interviews (FGIs). FGIs are a research method for obtaining necessary or additional information about a subject

through a guided interview process, in which expert participants freely discuss and exchange opinions about the subject in a small group (Gall et al., 2007; Morgan, 1993). Unlike the Delphi survey, which is mainly helpful for collecting quantitative data to derive consensus about a topic from individual experts' opinions, FGIs can provide in-depth information about a subject or a problem, collecting mainly qualitative data through intensive interaction and discussion among participants (Savin-Baden & Major, 2013). Therefore, in some studies investigating ICF core or code sets, an additional FGI following the Delphi surveys has been conducted to identify the specific reasons the final codes were selected, as well as discuss the relevant codes that were not selected (Yonsei University Center for Social Welfare Research & Samyook Rehabilitation Center, 2009). However, the present study had a limited budget and little time to conduct a FGI after three rounds of the Delphi questionnaire survey; consequently, an FGI could not be conducted to empirically verify the results. Thus, this study only theoretically verified the content validity of the final code sets, using previous study results on Korean ICF core sets, developmental theory, and official documents on special education services in South Korea.

5.2.2 Study Contributions

Importantly, this study managed to derive the essential ICF-CY assessment codes for providing effective special education services for pupils with physical disabilities in South Korea that conform to a holistic, interactive perspective between the medical and social models of disability. This achievement will contribute in practical terms to resolving the problems of using mere diagnostic evaluation to decide eligibility for special education services, by providing more holistic assessments from an interactive perspective. Following the seven contributions of the ICF-CY for special education suggested by Simeonsson et al. (2008), this study outlines four practical contributions below.

First, the final code sets directly offer holistic profiles for judging the eligibility of special education services provision for pupils with physical disabilities in preschool, elementary school, and secondary school in South Korea. Currently, official evaluations for determining eligibility for special education services simply rely on individual deficits in the body or learning in South Korea. When evaluations of eligibility merely focus on within-child factors, without considering children's level of participation and surrounding environment, this can result in considerable blind spots in the provision of effective special education services

(Hollenweger & Moretti, 2012). For example, even though a child with physical disabilities might experience serious restrictions in his or her participation in school activities, due to unsuitable school facilities or peers' negative attitudes towards disability, this child would still not be eligible for special education services if his or her bodily functioning or learning ability was just slightly higher than the present criteria. In contrast, the ICF-CY Code Sets for Pupils with Physical Disabilities yields codes for evaluating pupils' functioning and needs holistically (including the body, activities, participation, and environment). These code sets can thus serve as holistic profiles that reduce the blind spots that currently permeate the methods for determining eligibility of special education services.

A second contribution of this study is that the final code sets can be used for planning individualized education plans (IEPs). Currently, traditional evaluations for determining eligibility lack methods to elicit information on children's overall functional characteristics, which would aid in planning IEPs (Hollenweger & Moretti, 2012). In contrast, the final code sets provide profiles of children's limitations in functioning, activities, and participation. In addition, they highlight the environmental factors that may influence such functioning. Thus, these functional profiles can provide a practical framework for creating IEPs.

A third contribution is that the final code sets can guide in the development or selection of assessment and outcome monitoring tools for special education services. Rather than being assessment instruments per se, the ICF-CY code sets can provide an adequate basis of the to-be-measured constructs for new instruments that not only assess the functioning of pupils with physical disabilities but also monitor the outcomes of special education services, especially in the components of activities (Wells & Hogan, 2003), participation (Forsyth & Javis, 2002), and environmental factors (Simeonsson et al., 2008).

Finally, the final code sets can facilitate collaboration between multidisciplinary team members in special education services for pupils with physical disabilities. The ICF-CY was developed to create a common taxonomy of childhood functioning to enhance communication among professionals of different disciplines (WHO, 2007). In particular, special education services typically require collaboration between professionals of various fields, such as special education, social work, clinic fields, and vocational education, both legally as well as practically (Park & Kim, 2012). Thus, the ICF-CY Code Sets for Pupils with Physical Disabilities will be able to enhance communication and collaboration between

interdisciplinary specialists, including parents, for assessing and monitoring the outcomes of special education services for pupils with physical disabilities.

5.2.3 Future Directions

Further research is needed to realize the above four contributions of this study in the future. The final code sets must be verified further using FGIs or a large-scale survey with a much larger sample of special education service experts in order to improve the current study's content and external validity. Second, it would be important to develop a functional profile checklist and an IEP form that reflect the content of the four components of the ICF-CY, in order to practice effective inclusive education based on the interactive model of disability (Lindsay, 2003; Norwich, 2002). Third, at least two further lines of inquiry on assessment tools must be developed: one that examines the relationships of the final code sets to existing assessment instruments, and the other developing new assessment tools for evaluating functioning by using the final code sets. Fourth, further studies could also be conducted to examine special education service providers' opinions on the usefulness of the ICF-CY Code Sets for Pupils with Physical Disabilities, particularly in terms of how it affects multidisciplinary team communication and collaboration for provision of special education services. Finally, future research can statistically survey the level of participation and environment for pupils with physical disabilities in Korean inclusive schools by using the final codes for the Activities and Participation and Environmental Factors components.

5.3 Conclusion

This study aimed to derive the essential codes representing the functioning of pupils with physical disabilities in three age groups (preschool age: 3–6 years old; elementary school age: 7–12 years old; secondary school age: 13–18 years old) for use in the assessment and improvement of special education services support in South Korea. In order to derive these essential codes, the present study carried out between one and three rounds of Delphi surveys on the Body Functions and Structures, Activities and Participation, and Environmental Factors components of the ICF-CY. The final essential codes were derived from consensus between physiatrists, parents, special educators, and special education professors, who are nationally representative in their field. The final codes were organized into three age-based code sets for the ICF-CY (3–5 years old, 6–12 years old, and 13–18 years old) (Appendix M).

The ICF-CY code sets for pupils with physical disabilities will contribute mainly to resolving an urgent issue in South Korea, where assessments for the eligibility of special education services are conducted using only the medical model, when what is needed to ensure effective support is a more interactive model. This study made four practical contributions for pupils with physical disabilities: (1) offering holistic profiles for use in determining eligibility of special education services; (2) planning effective and holistic IEPs; (3) guiding the development and selection of assessment and outcome monitoring tools for special education services; and (4) facilitating the collaboration of multidisciplinary team members in special education services. Despite these contributions, there are some limitations, including the small sample size of the panel investigating Body Functions and Structures, as well as no additional empirical validation survey. Thus, to maximize the significant contributions and minimize the limitations of this study, five directions for further research are suggested: (1) conducting empirical validation surveys, using methods such as FGIs; (2) developing a profile checklist and an IEP form based on the ICF-CY code sets; (3) linking the final code sets to existing assessment instruments and developing new assessment tools based on the code sets; (4) examining the utility of the code sets in facilitating collaboration in special education services; and (5) evaluating the level of participation and environment for pupils with physical disabilities in Korean inclusive schools.

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Appendices

Appendix A: Consent Letter for Body Functions & Structures Survey

Consent Letter

Dear Physiatrists,

I am a student at the University of Oslo studying for my master's degree in special needs education, and I am a temporary researcher with the Korean Solidarity for Human Rights of Disabled People with Brain Lesions (KSHB). I am conducting this study for my master thesis (*"Deriving Code Sets for Pupils with Physical Disabilities from the ICF-CY"*), and also as part of a research project of the KSHB (*"A Feasibility Study of the ICF as an Assessment Tool for the Welfare Service of Persons with Disabilities"*) funded by the Ministry of Health & Welfare.

The objective of this survey is to identify the most relevant categories in the International Classification of Functioning, Disability and Health, for Children and Youth (ICF-CY) to describe the functioning of pupils with physical disabilities, including cerebral palsy, according to age groups. The ICF-CY was developed to record the childhood functioning and development by the World Health Organization (WHO) in 2007. It provides multidisciplinary service providers such as educators and clinicians with a common language in the form of a classification or code to explain the individual and societal factors that influence the functioning or performance of children with or without disabilities. However, there are too many classifications or codes in the ICF-CY for practical use with pupils with physical disabilities. Therefore, I would like to identify the most relevant ICF-CY classifications or code items to assess the functioning of pupils with physical disabilities in each of three age groups. This information would be useful in planning comprehensive special education services. This is because such services involve individualized education and therapy programs and environmental supports. For this purpose, I am seeking your opinions about the ICF-CY classifications or code items.

In order to achieve my study goal, I would like to survey your opinions to derive a consensus on the following question: *What categories in the ICF-CY are relevant to assess body functions and structures for pupils with physical disabilities, including cerebral palsy, in each age group (3–5, 6–12, and 13–18 years)*?

If you decide to participate in my research, I will survey your opinion about the most relevant classification of the ICF-CY for pupils with physical disabilities in each age group (3–5, 6–12, and 13–

18 years) by sending a questionnaire to your e-mail address. The completed questionnaire is to be returned to my e-mail address within three weeks of receiving it.

A ₩ 50,000 honorarium will be paid to you at the end of the questionnaire survey. You have the right to withdraw from the survey without giving a reason. The complete confidentiality of your responses and personal information is guaranteed by the regulations of Norwegian Social Science Data Services as well as applicable law, and your information will not be used for any purpose other than this research. Specifically, all of your information will be used anonymously, and no one except me will have access to the data. Moreover, when the thesis is completed in June 2013, all records and personal information will be deleted. Since all ethical requirements are met, this survey has been approved by the Ombudsman for Privacy in Research, Norwegian Social Science Data Services.

By participating in this survey, you are contributing to the holistic assessment and support for pupils with physical disabilities in special education services. In order to provide comprehensive special education services, the functioning of children with disabilities has to be assessed in both individual and environmental aspects. However, there is no holistic assessment tool and procedure in Korean special education services. To solve the absence of the holistic assessment in special education service, many international scholars recommend to use the ICF-CY. Therefore, your participation in this survey will be extremely helpful to realize the holistic assessment and support for pupils with physical disabilities in special education services.

If you have any questions, please feel free to contact me (Sangwon Yoon / Telephone / E-mail) or my supervisor (Peer Møller Sørensen / Telephone / E-mail). If you agree to participate in this survey, please fill in the information below and return this form to Sangwon Yoon before XX. XX. 2013 by using the attached self-addressed, stamped envelope.

Thank you very much in advance!
Yours sincerely,
Researcher Sangwon Yoon
University of Oslo & Korean Solidarity for Human Rights of Disabled People with Brain Lesions

Full name of the participant: _____

E-mail address: _____ Phone number: _____

Signature: _____ Date: _____

Appendix B: Questionnaire on Body Functions & Structures

Questionnaire on Body Functions and Structures

Number of Panel	
Target Age Group	**3–5 age group**

Expert Delphi Survey to Identify Classification Codes for Pupils with Physical Disabilities from the *International Classification of Functioning, Disability and Health, for Children and Youth* (ICF-CY)

Dear Physiatrists,

This survey is being conducted for my master's study and as part of a research project of the Korean Solidarity for Human Rights of Disabled People with Brain Lesions (KSHB) (Researcher Sangwon Yoon, Master's Student at University of Oslo and Temporary Researcher of KSHB). The purpose of this research is to identify the most relevant classification items/codes of the International Classification of Functioning, Disability and Health, for Children and Youth (ICF-CY) to assess and support functioning of pupils with physical disabilities, including cerebral palsy (CP).

The ICF-CY, approved by the World Health Organization (WHO) in 2007, is the first universal classification system to document functioning and disability of children and youth from a perspective of individual and environmental factors. It not only offers a common language of functioning and disability in childhood and adolescence across disciplines and nations, but it also provides comprehensive information about both the individual and environmental factors that influence an individual child's functioning. That is, the ICF-CY overcomes the medical model in which disability is viewed only as the result of individual disease or deficit, and it also provides an internationally common classification system to record childhood health and functioning from a holistic bio-psycho-social perspective.

The aim of this survey is to request your professional medical opinion about the most relevant codes in the Body Functions and Structures domain of the ICF-CY for pupils with physical disabilities, including CP, in three age groups (3–5, 6–12, and 13–18 years). Your honest response to every item will be helpful to this study.

Please understand that although the ICF-CY is a universally applicable classification system for all countries, there may be awkward expressions and unfamiliar categories or codes as a result of translating the terms from Korean into English. All responses will be kept confidential by applicable law, and survey results will not be used for any purpose other than this research.

Thank you for your cooperation.

♠ If you have questions about the survey, please contact us below.
- Researcher: Sangwon Yoon (Master's Student at University of Oslo & Temporary Researcher of KSHB)
- Tel: XXX-XXX-XXXX
- E-mail: XXXXXX@XXXX.XXX

Department of Special Needs Education
University of Oslo

Korean Solidarity for Human Rights of
Disabled People with Brain Lesions

❖ Overview of the ICF-CY

The International Classification of Functioning, Disability and Health, for Children and Youth (ICF-CY), developed by the WHO in 2007, is a universal framework and language to record health and development in childhood and adolescence. The overall aim of the ICF-CY classification is to offer standard terms to describe health and health-related conditions.

The ICF-CY categories describe health and health-related conditions in two main parts: (1) *Functioning and Disability* and (2) *Contextual Factors*. *Functioning* is an umbrella term concerned with the integrity of body functions and structures, activities and participation. *Disability* is an umbrella term for impairments of body, activity limitations or participation restrictions. The ICF-CY also lists environmental factors that interact with functioning and disability. In this way, the ICF-CY describes and assesses a child's functioning and disability from an interactive and comprehensive perspective that considers individual and environmental factors.

The functioning and disability section consists of two components: (1) *Body Functions & Structures* and (2) *Activities & Participation*. Two other components belong to the Contextual Factors section: (1) *Environmental Factors* and (2) *Personal Factors*. Although personal factors have not yet been classified, they make up a component of the ICF-CY. The ICF-CY categories represent the units of the ICF-CY classification. Within the hierarchical coding system of the ICF-CY classification, the ICF-CY categories are designated by the letters "b" for body functions, "s" for body structures, "d" for domains representing activities & participation component, and "e" for environmental factors, followed by a numeric code. Numeric codes start with the chapter number (1 digit), followed by the second level (2 digits), and the third and fourth levels (1 digit each). Therefore, within each chapter, there are individual 2-level, 3-level, or 4-level categories, as shown in Figure 1. An example drawn from the Environmental factors component is expressed as follows:

e1 Products and technology	(first level)
e115 Products and technology for personal use in daily living	(second level)
e1152 Products and technology used for play	(third level)
e11521 Adapted products and technology for play	(fourth level)

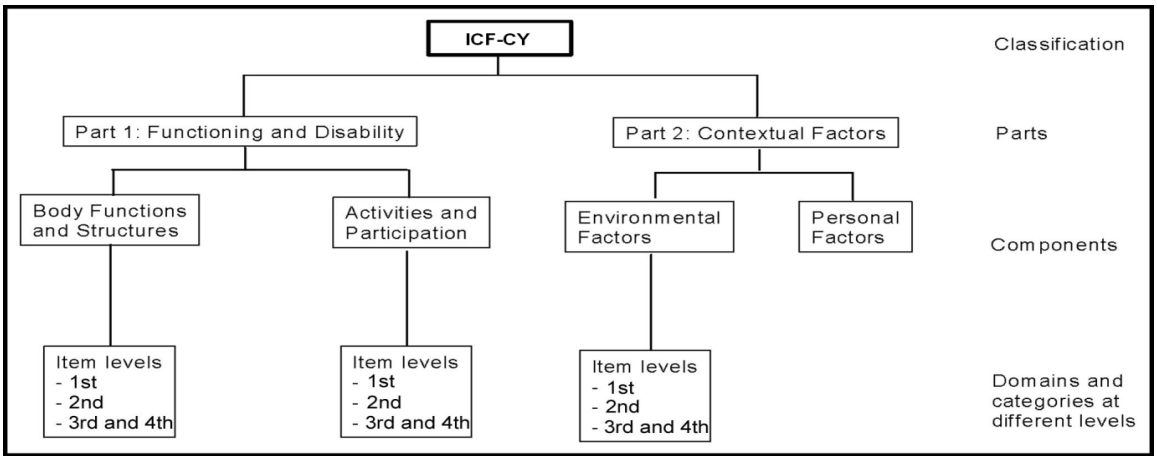

Figure 1. Structure of the International Classification of Functioning, Disability and Health, for Children and Youth (ICF-CY).

The objective of this study is to identify the most relevant two-level categories or in the three components of the ICF-CY to assess functioning of pupils with physical disabilities, including CP, in each of three age groups (3–5, 6–12, and 13–18 years) based on a consensus of professionals and parents. The information will be useful in designing comprehensive special education services which reflect the characteristics of physical disabilities (including CP) and the developmental characteristics in childhood and adolescence as well as environmental changes in this period. To achieve this research goal, physiatrists will identify the most relevant categories of the Body Functions and Structures domain, and the categories of Activities and Participation and Environmental Factors domains will be identified by special educators, special education professors, and parents with children having physical disabilities.

The main question for physiatrists is the following:

- **What codes of the ICF-CY are relevant to assess body functions & structures for pupils with physical disabilities, including cerebral palsy, in each age group (3–5, 6–12, and 13–18 years)?**

※ The two-level categories or codes presented in the following questionnaire are based on the ICF-CY, with additional explanation or examples for clarity.

[Body Functions]

The following are the categories and codes in the Body Functions domain of the ICF-CY. Please mark with a ✓ either ***Very Relevant***, ***Somewhat Relevant***, ***Slightly Relevant***, or ***Not Relevant*** in the appropriate columns depending on the ***extent of relevance to body functions of pupils aged 3–5 years with physical disabilities*.** In this questionnaire, the range of physical disabilities includes limitations in sustaining the trunk or moving the limbs and cerebral palsy. For example, in "Articulation functions (b320)," if you think that the articulation functions of pupils aged three to five years with physical disabilities is relatively very impaired, you would check Very Relevant; if you think that this body function is somewhat impaired, you would check Somewhat Relevant; if you think that this body function is slightly impaired, you would check Slightly Relevant; and if you think that this body function is absolutely not impaired, you would check Not Relevant. In addition to ***physical disabilities***, you must consider the ***developmental characteristics of early childhood*** at age 3–5 years when you make your choice. (Please choose only one option for each category or code according to your own professional opinion about the body functions of pupils with physical disabilities in the 3–5 age group.)

1. Mental functions

Code	Category	Description	*Very Relevant*	*Somewhat Relevant*	*Slightly Relevant*	*Not Relevant*
Global mental functions						
b110	Consciousness functions	General mental functions of the state of awareness and alertness, including the clarity and continuity of the wakeful state.				
b114	Orientation functions	General mental functions of knowing and ascertaining one's relation to object, to self, to others, to time and to one's surroundings and space.				
b117	Intellectual functions	General mental functions, required to understand and constructively integrate the various mental functions, including all cognitive functions and their development over the life span.				
b122	Global psychosocial functions	General mental functions, as they develop over the life span, required to understand and constructively integrate the mental functions that lead to the formation of the personal and interpersonal skills needed to establish reciprocal social interactions, in terms of both meaning and purpose.				
b125	Dispositions and intra-personal functions	Disposition to act or react in a particular way, characterizing the personal, behavioural style of an individual that is distinct from others. These behavioural and responses styles are developmental in nature and may be foundational for later patterns of temperament and personality functions.				
b126	Temperament and personality functions	General mental functions of constitutional disposition of the individual to react in a particular way to situations, including the set of mental characteristics that makes the individual distinct from others.				

Code	Category	Description	*Very Relevant*	*Somewhat Relevant*	*Slightly Relevant*	*Not Relevant*
b130	Energy and drive functions	General mental functions of physiological and psychological mechanisms that cause the individual to move towards satisfying specific needs and general goals in a persistent manner.				
b134	Sleep functions	General mental functions of periodic, reversible and selective physical and mental disengagement from one's immediate environment accompanied by characteristic physiological changes.				
Specific mental functions						
b140	Attention functions	Specific mental functions of focusing on an external stimulus or internal experience for the required period of time.				
b144	Memory functions	Specific mental functions of registering and storing information and retrieving it as needed.				
b147	Psychomotor functions	Specific mental functions of control over both motor and psychological events at the body level.				
b152	Emotional functions	Specific mental functions related to the feeling and affective components of the processes of the mind.				
b156	Perceptual functions	Specific mental functions of recognizing and interpreting sensory stimuli.				
b160	Thought functions	Specific mental functions related to the ideational component of the mind.				
b163	Basic cognitive functions	Mental functions involved in acquisition of knowledge about objects, events and experiences; and the organization and application of that knowledge in tasks requiring mental activity.				
b164	Higher-level cognitive functions	Specific mental functions especially dependent on the frontal lobes of the brain, including complex goal-directed behaviours such as decision-making, abstract thinking, planning and carrying out plans, mental flexibility, and deciding which behaviours are appropriate under what circumstances; often called executive functions.				
b167	Mental functions of language	Specific mental functions of recognizing and using signs, symbols and other components of a language.				
b172	Calculation functions	Specific mental functions of determination, approximation and manipulation of mathematical symbols and processes.				
b176	Mental function of sequencing complex movements	Specific mental functions of sequencing and coordinating complex, purposeful movements.				
b180	Experience of self and time functions	Specific mental functions related to the awareness of one's identity, one's body, one's position in the reality of one's environment and of time.				

2. Sensory functions and pain

Code	Category	Description	*Very Relevant*	*Somewhat Relevant*	*Slightly Relevant*	*Not Relevant*
Seeing and related functions						
b210	Seeing functions	Sensory functions relating to sensing the presence of light and sensing the form, size, shape and colour of the visual stimuli.				
b215	Functions of structures adjoining the eye	Functions of structures in and around the eye that facilitate seeing functions.				
b220	Sensations associated with the eye and adjoining structures	Sensations of tired, dry and itching eye and related feelings.				
Hearing and vestibular functions						
b230	Hearing functions	Sensory functions relating to sensing the presence of sounds and discriminating the location, pitch, loudness and quality of sounds.				
b235	Vestibular functions	Sensory functions of the inner ear related to position, balance and movement.				
b240	Sensations associated with hearing and vestibular function	Sensations of dizziness, falling, tinnitus and vertigo.				
Additional sensory functions						
b250	Taste function	Sensory functions of sensing qualities of bitterness, sweetness, sourness and saltiness.				
b255	Smell function	Sensory functions of sensing odours and smells.				
b260	Proprioceptive function	Sensory functions of sensing the relative position of body parts.				
b265	Touch function	Sensory functions of sensing surfaces and their texture or quality.				
b270	Sensory functions related to temperature and other stimuli	Sensory functions of sensing temperature, vibration, pressure and noxious stimulus.				
Pain						
b280	Sensation of pain	Sensation of unpleasant feeling indicating potential or actual damage to some body structure.				

3. Voice and speech functions

Code	Category	Description	*Very Relevant*	*Somewhat Relevant*	*Slightly Relevant*	*Not Relevant*
b310	Voice functions	Functions of the production of various sounds by the passage of air through the larynx.				
b320	Articulation functions	Functions of the production of speech sounds.				

Code	Category	Description	*Very Relevant*	*Somewhat Relevant*	*Slightly Relevant*	*Not Relevant*
b330	Fluency and rhythm of speech functions	Functions of the production of flow and tempo of speech.				
b340	Alternative vocalization functions	Functions of the production of other manners of vocalization.				

4. Functions of the cardiovascular, haematological, immunological and respiratory systems

Code	Category	Description	*Very Relevant*	*Somewhat Relevant*	*Slightly Relevant*	*Not Relevant*
Functions of the cardiovascular system						
b410	Heart functions	Functions of pumping the blood in adequate or required amounts and pressure throughout the body.				
b415	Blood vessel functions	Functions of transporting blood throughout the body.				
b420	Blood pressure functions	Functions of maintaining the pressure of blood within the arteries.				
Functions of the haematological and immunological system						
b430	Haematological system functions	Functions of blood production, oxygen and metabolite carriage, and clotting.				
b435	Immunological system functions	Functions of the body related to protection against foreign substances, including infections, by specific and non-specific immune responses.				
Functions of the respiratory system						
b440	Respiration functions	Functions of inhaling air into the lungs, the exchange of gases between air and blood, and exhaling air.				
b445	Respiratory muscle functions	Functions of the muscles involved in breathing.				
Additional functions and sensations of the cardiovascular and respiratory systems						
b450	Additional respiratory functions	Additional functions related to breathing, such as coughing, sneezing and yawning.				
b455	Exercise tolerance functions	Functions related to respiratory and cardiovascular capacity as required for enduring physical exertion.				
b460	Sensations associated with cardiovascular and respiratory functions	Sensations such as missing a heart beat, palpitation and shortness of breath.				

5. Functions of the digestive, metabolic and endocrine systems

Code	Category	Description	*Very Relevant*	*Somewhat Relevant*	*Slightly Relevant*	*Not Relevant*
Functions of the digestive systems						
b510	Ingestion functions	Functions related to taking in and manipulating solids or liquids through the mouth into the body.				

Code	Category	Description	*Very Relevant*	*Somewhat Relevant*	*Slightly Relevant*	*Not Relevant*
b515	Digestive functions	Functions of transporting food through the gastrointestinal tract, breakdown of food and absorption of nutrients.				
b520	Assimilation functions	Functions by which nutrients are converted into components of the living body.				
b525	Defecation functions	Functions of elimination of wastes and undigested food as faeces and related functions.				
b530	Weight maintenance functions	Functions of maintaining appropriate body weight, including weight gain during the developmental period.				
b535	Sensations associated with the digestive system	Sensations arising from eating, drinking and related digestive functions.				
Functions related to metabolism and the endocrine system						
b540	General metabolic functions	Functions of regulation of essential components of the body such as carbohydrates, proteins and fats, the conversion of one to another, and their breakdown into energy.				
b545	Water, mineral and electrolyte balance functions	Functions of the regulation of water, mineral and electrolytes in the body.				
b550	Thermoregulatory functions	Functions of the regulation of body temperature.				
b555	Endocrine gland functions	Functions of production and regulation of hormonal levels in the body, including cyclical changes.				
b560	Growth maintenance functions	Functions of attaining expected growth milestones according to contextually adjusted normative auxological parameters.				

6. Genitourinary and reproductive functions

Code	Category	Description	*Very Relevant*	*Somewhat Relevant*	*Slightly Relevant*	*Not Relevant*
Urinary functions						
b610	Urinary excretory functions	Functions of filtration and collection of the urine.				
b620	Urination functions	Functions of discharge of urine from the urinary bladder.				
b630	Sensations associated with urinary functions	Sensations arising from voiding and related urinary functions.				
Genital and reproductive functions						
b640	Sexual functions	Mental and physical functions related to the sexual act, including the arousal, preparatory, orgasmic and resolution stages.				

Code	Category	Description	*Very Relevant*	*Somewhat Relevant*	*Slightly Relevant*	*Not Relevant*
b650	Menstruation functions	Functions associated with the menstrual cycle, including regularity of menstruation and discharge of menstrual fluids.				
b660	Procreation functions	Functions associated with fertility, pregnancy, childbirth and lactation.				
b670	Sensations associated with genital and reproductive functions	Sensations arising from sexual arousal, intercourse, menstruation, and related genital or reproductive functions.				

7. Neuromusculoskeletal and movement-related functions

Code	Category	Description	*Very Relevant*	*Somewhat Relevant*	*Slightly Relevant*	*Not Relevant*
Functions of the joints and bones						
b710	Mobility of joint functions	Functions of the range and ease of movement of a joint.				
b715	Stability of joint functions	Functions of the maintenance of structural integrity of the joints.				
b720	Mobility of bone functions	Functions of the range and ease of movement of the scapula, pelvis, carpal and tarsal bones.				
Muscle functions						
b730	Muscle power functions	Functions related to the force generated by the contraction of a muscle or muscle groups.				
b735	Muscle tone functions	Functions related to the tension present in the resting muscles and the resistance offered when trying to move the muscles passively.				
b740	Muscle endurance functions	Functions related to sustaining muscle contraction for the required period of time.				
Movement functions						
b750	Motor reflex functions	Functions of involuntary contraction of muscles automatically induced by specific stimuli.				
b755	Involuntary movement reaction functions	Functions of involuntary contractions of large muscles or the whole body induced by body position, balance and threatening stimuli.				
b760	Control of voluntary movement functions	Functions associated with control over and coordination of voluntary movements.				
b761	Spontaneous movements	Functions associated with frequency, fluency and complexity of total and individual body-part movements, such as infant spontaneous movements.				
b765	Involuntary movement functions	Functions of unintentional, non- or semi-purposive involuntary contractions of a muscle or group of muscles.				

Code	Category	Description	*Very Relevant*	*Somewhat Relevant*	*Slightly Relevant*	*Not Relevant*
b770	Gait pattern functions	Functions of movement patterns associated with walking, running or other whole body movements.				
b780	Sensations related to muscles and movement functions	Sensations associated with the muscles or muscle groups of the body and their movement.				

8. Functions of the skin and related structures

Code	Category	Description	*Very Relevant*	*Somewhat Relevant*	*Slightly Relevant*	*Not Relevant*
Functions of the skin						
b810	Protective functions of the skin	Functions of the skin for protecting the body from physical, chemical and biological threats.				
b820	Repair functions of the skin	Functions of the skin for repairing breaks and other damage to the skin.				
b830	Other functions of the skin	Functions of the skin other than protection and repair, such as cooling and sweat secretion.				
b840	Sensation related to the skin	Sensations related to the skin such as itching, burning sensation and tingling.				
Functions of the hair and nails						
b850	Functions of hair	Functions of the hair, such as protection, coloration and appearance.				
b860	Functions of nails	Functions of the nails, such as protection, scratching and appearance.				

[Body Structures]

The following are the categories and codes in the Body Functions domain of the ICF-CY. Please mark with a ✓ either ***Very Relevant***, ***Somewhat Relevant***, ***Slightly Relevant***, or ***Not Relevant*** in the appropriate columns depending on the ***extent of relevance to body structures of pupils aged 3–5 years with physical disabilities*.** In this questionnaire, the range of physical disabilities includes limitations in sustaining the trunk or moving the limbs and cerebral palsy. For example, in "Structure of trunk (s760)," if you think that this body structure of pupils aged 3–5 years with physical disabilities is relatively very impaired, you would check Very Relevant; if you think this body structure is somewhat impaired, you would check Somewhat Relevant; if you think this body structure is slightly impaired, you would check Slightly Relevant; and if you think this body structure is absolutely not impaired, you would check Not Relevant. In addition to ***physical disabilities***, you must consider the ***developmental characteristics of early childhood*** at age 3–5 years when you make your choice. (Please choose only one option for each category or code according to your own professional opinion about the body functions of pupils with physical disabilities in the 3–5 age group.)

1. Structures of the nervous system

Code	Category	Description	*Very Relevant*	*Somewhat Relevant*	*Slightly Relevant*	*Not Relevant*
s110	Structure of brain					
s120	Spinal cord and related structures					
s130	Structure of meninges					
s140	Structure of sympathetic nervous system					
s150	Structure of parasympathetic nervous system					

2. The eye, ear and related structures

Code	Category	Description	*Very Relevant*	*Somewhat Relevant*	*Slightly Relevant*	*Not Relevant*
s210	Structure of eye socket					
s220	Structure of eyeball					
s230	Structures around eye					
s240	Structure of external ear					
s250	Structure of middle ear					
s260	Structure of inner ear					

3. Structures involved in voice and speech

Code	Category	Description	*Very Relevant*	*Somewhat Relevant*	*Slightly Relevant*	*Not Relevant*
s310	Structure of nose					

Code	Category	Description	*Very Relevant*	*Somewhat Relevant*	*Slightly Relevant*	*Not Relevant*
s320	Structure of mouth					
s330	Structure of pharynx					
s340	Structure of larynx					

4. Structures of the cardiovascular, immunological and respiratory systems

Code	Category	Description	*Very Relevant*	*Somewhat Relevant*	*Slightly Relevant*	*Not Relevant*
s410	Structure of cardiovascular system					
s420	Structure of immune system					
s430	Structure of respiratory system					

5. Structures related to the digestive, metabolic and endocrine systems

Code	Category	Description	*Very Relevant*	*Somewhat Relevant*	*Slightly Relevant*	*Not Relevant*
s510	Structure of salivary glands					
s520	Structure of oesophagus					
s530	Structure of stomach					
s540	Structure of intestine					
s550	Structure of pancreas					
s560	Structure of liver					
s570	Structure of gall bladder and ducts					
s580	Structure of endocrine glands					

6. Structures related to the genitourinary and reproductive systems

Code	Category	Description	*Very Relevant*	*Somewhat Relevant*	*Slightly Relevant*	*Not Relevant*
s610	Structure of urinary system					
s620	Structure of pelvic floor					
s630	Structure of reproductive system					

7. Structures related to movement

Code	Category	Description	*Very Relevant*	*Somewhat Relevant*	*Slightly Relevant*	*Not Relevant*
s710	Structure of head and neck region					

Code	Category	Description	*Very Relevant*	*Somewhat Relevant*	*Slightly Relevant*	*Not Relevant*
s720	Structure of shoulder region					
s730	Structure of upper extremity					
s740	Structure of pelvic region					
s750	Structure of lower extremity					
s760	Structure of trunk					
s770	Additional musculoskeletal structures related to movement					

8. Skin and related structures

Code	Category	Description	*Very Relevant*	*Somewhat Relevant*	*Slightly Relevant*	*Not Relevant*
s810	Structure of areas of skin					
s820	Structure of skin glands					
s830	Structure of nails					
s840	Structure of hair					

Thank you for your cooperation!

Appendix C: Consent Letter for Body Functions & Structures Survey

Consent Letter

Dear (Parents, Special Educators, or Special Education Professors),

I am a student at the University of Oslo studying for my master's degree in special needs education, and I am a temporary researcher with the Korean Solidarity for Human Rights of Disabled People with Brain Lesions (KSHB). I am conducting this study for my master thesis (*"Deriving Code Sets for Pupils with Physical Disabilities from the ICF-CY"*), and also as part of a research project of the KSHB (*"A Feasibility Study of the ICF as an Assessment Tool for the Welfare Service of Persons with Disabilities"*) funded by the Ministry of Health & Welfare.

The objective of this survey is to identify the most relevant categories in the International Classification of Functioning, Disability and Health, for Children and Youth (ICF-CY) to describe the functioning of pupils with physical disabilities, including cerebral palsy, according to age groups. The ICF-CY was developed to record the childhood functioning and development by the World Health Organization (WHO) in 2007. It provides multidisciplinary service providers such as educators and clinicians with a common language in the form of a classification or code to explain the individual and societal factors that influence the functioning or performance of children with or without disabilities. However, there are too many classifications or codes in the ICF-CY for practical use with pupils with physical disabilities. Therefore, I would like to identify the most relevant ICF-CY classifications or code items to assess the functioning of pupils with physical disabilities in each of three age groups. This information would be useful in planning comprehensive special education services. This is because such services involve individualized education and therapy programs and environmental supports. For this purpose, I am seeking your opinions about the ICF-CY classifications or code items.

In order to achieve my study goal, I would like to survey your opinions to derive a consensus on the following question: *What categories in the ICF-CY are relevant and appropriate to assess activities & participation and environmental factors for pupils with physical disabilities, including cerebral palsy, in each age group (3–5, 6–12, and 13–18 years)*?

If you decide to participate in my research, here is what will happen:

1. I will first survey your opinion about the most relevant classification of the ICF-CY for pupils with physical disabilities in each age group (3–5, 6–12, and 13–18 years) by sending a question naire to your e-mail address. The completed questionnaire is to be returned to my e-mail addres s within two weeks of receiving it.
2. Three weeks later, I will send a second-round questionnaire in which the categories have been r

educed from the original, as determined by the consensus of participants on the first-round questionnaire. I will also include results of the first-round questionnaire to enable reference to others' opinions. The completed second-round questionnaire is to be returned to me by e-mail within two weeks.

3. Five weeks later, I will send a final questionnaire in which the categories are again reduced through the same process as described for the second-round questionnaire.

A ₩ 50,000 honorarium will be paid to you at the end of the last questionnaire survey. You have the right to withdraw from the survey without giving a reason. The complete confidentiality of your responses and personal information is guaranteed by the regulations of Norwegian Social Science Data Services as well as applicable law, and your information will not be used for any purpose other than this research. Specifically, all of your information will be used anonymously, and no one except me will have access to the data. Moreover, when the thesis is completed in June 2013, all records and personal information will be deleted. Since all ethical requirements are met, this survey has been approved by the Ombudsman for Privacy in Research, Norwegian Social Science Data Services.

By participating in this survey, you are contributing to the holistic assessment and support for pupils with physical disabilities in special education services. In order to provide comprehensive special education services, the functioning of children with disabilities has to be assessed in both individual and environmental aspects. However, there is no holistic assessment tool and procedure in Korean special education services. To solve the absence of the holistic assessment in special education service, many international scholars recommend to use the ICF-CY. Therefore, your participation in this survey will be extremely helpful to realize the holistic assessment and support for pupils with physical disabilities in special education services.

If you have any questions, please feel free to contact me (Sangwon Yoon / Telephone / E-mail) or my supervisor (Peer Møller Sørensen / Telephone / E-mail). If you agree to participate in this survey, please fill in the information below and return this form to Sangwon Yoon before XX. XX. 2013 by using the attached self-addressed, stamped envelope.

Thank you very much in advance!
Yours sincerely,
Researcher Sangwon Yoon
University of Oslo & Korean Solidarity for Human Rights of Disabled People with Brain Lesions

Full name of the participant: _____

E-mail address: _____ Phone number: _____

Signature: _____ Date: _____

Appendix D: First Round Questionnaire on Activities & Participation and Environmental Factors

First Round Questionnaire on Activities & Participation and Environmental Factors

Number of Panel	
Target Age Group	**3–5 age group**

Expert Delphi Survey to Identify Classification Codes for Pupils with Physical Disabilities from the *International Classification of Functioning, Disability and Health, for Children and Youth* (ICF-CY)

Dear (Special Educators, Professors, or Parents),

This survey is being conducted for my master's study and as part of a research project of the Korean Solidarity for Human Rights of Disabled People with Brain Lesions (KSHB) (Researcher Sangwon Yoon, Master's Student at University of Oslo and Temporary Researcher of KSHB). The purpose of this research is to identify the most relevant classification items/codes of the International Classification of Functioning, Disability and Health, for Children and Youth (ICF-CY) to assess and support functioning of pupils with physical disabilities, including cerebral palsy (CP).

The ICF-CY, approved by the World Health Organization (WHO) in 2007, is the first universal classification system to document functioning and disability of children and youth from a perspective of individual and environmental factors. It not only offers a common language of functioning and disability in childhood and adolescence across disciplines and nations, but it also provides comprehensive information about both the individual and environmental factors that influence an individual child's functioning. That is, the ICF-CY overcomes the medical model in which disability is viewed only as the result of individual disease or deficit, and it also provides an internationally common classification system to record childhood health and functioning from a holistic bio-psycho-social perspective.

The aim of this survey is to request your professional or parental opinion about the most relevant codes in the Activities & Participation and Environmental Factors domains of the ICF-CY for pupils with physical disabilities, including CP, in three age groups: 3–5, 6–12, and 13–18 years old. Your honest response to every item will be helpful to this study.

Please understand that although the ICF-CY is a universally applicable classification system for all countries, there may be awkward expressions and unfamiliar categories or codes as a result of translating the terms from Korean into English. All responses will be kept confidential by applicable law, and survey results will not be used for any purpose other than this research.

Thank you for your cooperation.

♠ If you have questions about the survey, please contact us below.
- Researcher: Sangwon Yoon (Master's Student at University of Oslo & Temporary Researcher of KSHB)
- Tel: XXX-XXX-XXXX
- E-mail: XXXXXX@XXXX.XXX

Department of Special Needs Education
University of Oslo

Korean Solidarity for Human Rights of Disabled People with Brain Lesions

❖ Overview of the ICF-CY

The International Classification of Functioning, Disability and Health, for Children and Youth (ICF-CY), developed by the WHO in 2007, is a universal framework and language to record health and development in childhood and adolescence. The overall aim of the ICF-CY classification is to offer standard terms to describe health and health-related conditions.

The ICF-CY categories describe health and health-related conditions in two main parts: (1) *Functioning and Disability* and (2) *Contextual Factors*. *Functioning* is an umbrella term concerned with the integrity of body functions and structures, activities and participation. *Disability* is an umbrella term for impairments of body, activity limitations or participation restrictions. The ICF-CY also lists environmental factors that interact with functioning and disability. In this way, the ICF-CY describes and assesses a child's functioning and disability from an interactive and comprehensive perspective that considers individual and environmental factors.

The functioning and disability section consists of two components: (1) *Body Functions & Structures* and (2) *Activities & Participation*. Two other components belong to the Contextual Factors section: (1) *Environmental Factors* and (2) *Personal Factors*. Although personal factors have not yet been classified, they make up a component of the ICF-CY. The ICF-CY categories represent the units of the ICF-CY classification. Within the hierarchical coding system of the ICF-CY classification, the ICF-CY categories are designated by the letters "b" for body functions, "s" for body structures, "d" for domains representing activities & participation component, and "e" for environmental factors, followed by a numeric code. Numeric codes start with the chapter number (1 digit), followed by the second level (2 digits), and the third and fourth levels (1 digit each). Therefore, within each chapter, there are individual 2-level, 3-level, or 4-level categories, as shown in Figure 1. An example drawn from the Environmental factors component is expressed as follows:

e1 Products and technology	(first level)
e115 Products and technology for personal use in daily living	(second level)
e1152 Products and technology used for play	(third level)
e11521 Adapted products and technology for play	(fourth level)

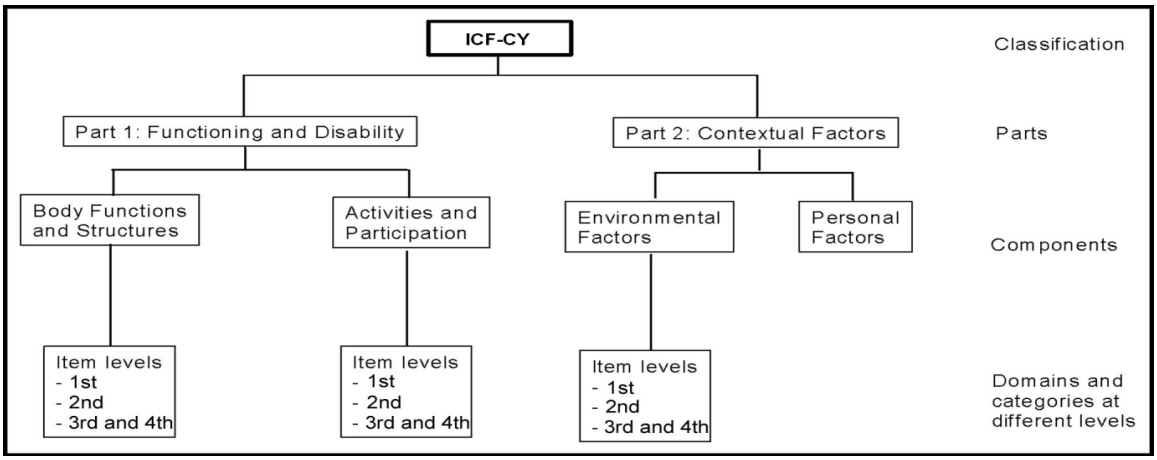

Figure 1. Structure of the International Classification of Functioning, Disability and Health, for Children and Youth (ICF-CY).

The objective of this study is to identify the most relevant two-level categories or in the three components of the ICF-CY to assess functioning of pupils with physical disabilities, including CP, in each of three age groups (3–5, 6–12, and 13–18 years) based on a consensus of professionals and parents. The information will be useful in designing comprehensive special education services which reflect the characteristics of physical disabilities (including CP) and the developmental characteristics in childhood and adolescence as well as environmental changes in this period. To achieve this research goal, physiatrists will identify the most relevant categories of the Body Functions and Structures domain, and the categories of Activities and Participation and Environmental Factors domains will be identified by special educators, special education professors, and parents with children having physical disabilities.

The main question for special educators, professors, or parents is the following:

- **Which codes of the ICF-CY are relevant to assess activities & participation and environmental factors for pupils with physical disabilities, including cerebral palsy, in each age group (3–5, 6–12, and 13–18 years old)?**

※ The two-level categories or codes presented in the following questionnaire are based on the ICF-CY, with additional explanation or examples for clarity.

[Activities & Participation]

The following are the categories and codes in the Activities and Participation domain of the ICF-CY. Please mark with a ✓ either ***Very Relevant***, ***Somewhat Relevant***, ***Slightly Relevant***, or ***Not Relevant*** in the appropriate columns depending on ***the extent of relevance to performance of pupils aged 3–5 years with physical disabilities*.** In this questionnaire, the range of physical disabilities includes limitations in sustaining the trunk or moving the limbs and cerebral palsy. For example, in "Transferring oneself (d335)," if you think that the performance of pupils aged 3 to 5 years with physical disabilities is very limited or restricted in moving their position, you would check Very Relevant; if you think the performance is somewhat limited or restricted, you would check Somewhat Relevant; if you think the performance is slightly limited or restricted, you would check Slightly Relevant; if you think the performance is absolutely not limited or restricted, you would check Not Relevant. In addition to ***physical disabilities***, you must consider the ***developmental characteristics of early childhood*** at age 3–5 years when you make your choice. (Please choose only one option for each category or code according to your own professional or parental opinion about the activities and participation of pupils with physical disabilities in the 3–5 age group.)

1. Learning and applying knowledge

Code	Category	Description	*Very Relevant*	*Somewhat Relevant*	*Slightly Relevant*	*Not Relevant*
Purposeful sensory experiences						
d110	Watching	Using the sense of seeing intentionally to experience visual stimuli, such as visually tracking an object, watching persons, looking at a sporting event, person, or children playing.				
d115	Listening	Using the sense of hearing intentionally to experience auditory stimuli, such as listening to a radio, the human voice, to music, a lecture, or to a story told.				
d120	Other purposeful sensing	Using the body's other basic senses intentionally to experience stimuli, such as touching and feeling textures, tasting sweets or smelling flowers.				
Basic learning						
d130	Copying	Imitating or mimicking as a basic component of learning, such as copying, repeating a facial expression, a gesture, a sound or the letters of an alphabet.				
d131	Learning through actions with objects	Learning through simple actions on a single object, two or more objects, symbolic and pretend play, such as in hitting an object, banging blocks and playing with dolls or cars.				
d132	Acquiring information	Obtaining facts about persons, things and events, such as asking why, what, where and how, asking for names.				

Code	Category	Description	*Very Relevant*	*Somewhat Relevant*	*Slightly Relevant*	*Not Relevant*
d133	Acquiring language	Developing the competence to represent persons, objects, events and feelings through words, symbols, phrases and sentences.				
d134	Acquiring additional language	Developing the competence to represent persons, objects, events, feelings through words, symbols, phrases and sentences, such as in an additional language or signing.				
d135	Rehearsing	Repeating a sequence of events or symbols as a basic component of learning, such as counting by tens or practising the recitation of a rhyme with gestures, counting by tens or practising the recitation of a poem.				
d137	Acquiring concepts	Developing competence to understand and use basic and complex concepts related to the characteristics of things, persons or events.				
d140	Learning to read	Developing the competence to read written material (including Braille and other symbols) with fluency and accuracy, such as recognizing characters and alphabets, sounding out written words with correct pronunciation, and understanding words and phrases.				
d145	Learning to write	Developing the competence to produce symbols that represent sounds, words or phrases in order to convey meaning (including Braille writing and other symbols), such as spelling effectively and using correct grammar.				
d150	Learning to calculate	Developing the competence to manipulate numbers and perform simple and complex mathematical operations, such as using mathematical signs for addition and subtraction and applying the correct mathematical operation to a problem.				
d155	Acquiring skills	Developing basic and complex competencies in integrated sets of actions or tasks so as to initiate and follow through with the acquisition of a skill, such as manipulating tools or toys, or playing games.				
Applying Knowledge						
d160	Focusing attention	Intentionally focusing on specific stimuli, such as by filtering out distracting noises.				
d161	Directing attention	Intentionally maintaining attention to specific actions or tasks for an appropriate length of time.				
d163	Thinking	Formulating and manipulating ideas, concepts, and images, whether goal-oriented or not, either alone or with others, with types of thinking activities, such as pretending, playing with words, creating fiction, proving a theorem, playing with ideas, brainstorming, meditating, pondering, speculating or reflecting.				
d166	Reading	Performing activities involved in the comprehension and interpretation of written language (e.g. books, instructions, newspapers in text or Braille), for the purpose of obtaining general knowledge or specific information.				

Code	Category	Description	*Very Relevant*	*Somewhat Relevant*	*Slightly Relevant*	*Not Relevant*
d170	Writing	Using or producing symbols or language to convey information, such as producing a written record of events or ideas or drafting a letter.				
d172	Calculating	Performing computations by applying mathematical principles to solve problems that are described in words and producing or displaying the results, such as computing the sum of three numbers or finding the result of dividing one number by another.				
d175	Solving problems	Finding solutions to questions or situations by identifying and analysing issues, developing options and solutions, evaluating potential effects of solutions, and executing a chosen solution such as in resolving a dispute between two people.				
d177	Making decisions	Making a choice among options, implementing the choice, and evaluating the effects of the choice, such as selecting and purchasing a specific item, or deciding to undertake and undertaking one task from among several tasks that need to be done.				

2. General tasks and demands

Code	Category	Description	*Very Relevant*	*Somewhat Relevant*	*Slightly Relevant*	*Not Relevant*
d210	Undertaking a single task	Carrying out simple or complex and coordinated actions related to the mental and physical components of a single task, such as initiating a task, organizing time, space and materials for a task, pacing task performance, and carrying out, completing and sustaining a task.				
d220	Undertaking multiple tasks	Carrying out simple or complex and coordinated actions as components of multiple, integrated and complex tasks in sequence or simultaneously.				
d230	Carrying out daily routine	Carrying out simple or complex and coordinated actions in order to plan, manage and complete the requirements of day-to-day procedures or duties, such as budgeting time and making plans for separate activities throughout the day.				
d240	Handling stress and other psychological demands	Carrying out simple or complex and coordinated actions to manage and control the psychological demands required to carry out tasks demanding significant responsibilities and involving stress, distraction, or crises, such as taking exams, driving a vehicle during heavy traffic, putting on clothes when hurried by parents, finishing a task within a time-limit or taking care of a large group of children.				
d250	Managing one's own behaviour	Carrying out simple or complex and coordinated actions in a consistent manner in response to new situations, persons or experiences, such as being quiet in a library.				

3. Communication

Code	Category	Description	*Very Relevant*	*Somewhat Relevant*	*Slightly Relevant*	*Not Relevant*
Communicating - receiving						
d310	Communicating with - receiving - spoken messages	Comprehending literal and implied meanings of messages in spoken language, such as understanding that a statement asserts a fact or is an idiomatic expression, such as responding and comprehending spoken messages.				
d315	Communicating with - receiving - nonverbal messages	Comprehending the literal and implied meanings of messages conveyed by gestures, symbols and drawings, such as realizing that a child is tired when she rubs her eyes or that a warning bell means that there is a fire.				
d320	Communicating with - receiving - formal sign language messages	Receiving and comprehending messages in formal sign language with literal and implied meaning.				
d325	Communicating with - receiving - written messages	Comprehending the literal and implied meanings of messages that are conveyed through written language (including Braille), such as following political events in the daily newspaper or understanding the intent of religious scripture.				
Communicating - Producing						
d330	Speaking	Producing words, phrases and longer passages in spoken messages with literal and implied meaning, such as expressing a fact or telling a story in oral language.				
d331	Pre-talking	Vocalizing when aware of another person in the proximal environment, such as producing sounds when the mother is close; babbling; babbling in turn-taking activities. Vocalizing in response to speech through imitating speech-sounds in a turn taking procedure.				
d332	Singing	Producing tones in a sequence resulting in a melody or performing songs on one's own or in a group.				
d335	Producing nonverbal messages	Using gestures, symbols and drawings to convey messages, such as shaking one's head to indicate disagreement or drawing a picture or diagram to convey a fact or complex idea.				
d340	Producing messages in formal sign language	Conveying, with formal sign language, literal and implied meaning.				
d345	Writing messages	Producing the literal and implied meanings of messages that are conveyed through written language, such as writing a letter to a friend.				
Conversation and use of communication devices and techniques						
d350	Conversation	Starting, sustaining and ending an interchange of thoughts and ideas, carried out by means of spoken, written, sign or other forms of language, with on				

Code	Category	Description	*Very Relevant*	*Somewhat Relevant*	*Slightly Relevant*	*Not Relevant*
d355	Discussion	Starting, sustaining and ending an examination of a matter, with arguments for or against, or debate carried out by means of spoken, written, sign or other forms of language, with one or more people one knows or who are strangers, in formal or casual settings.				
d360	Using communication devices and techniques	Using devices, techniques and other means for the purposes of communicating, such as calling a friend on the telephone.				

4. Mobility

Code	Category	Description	*Very Relevant*	*Somewhat Relevant*	*Slightly Relevant*	*Not Relevant*
Changing and maintaining body position						
d410	Changing basic body position	Getting into and out of a body position and moving from one location to another, such as rolling from one side to the other, sitting, standing, getting up out of a chair to lie down on a bed, and getting into and out of positions of kneeling or squatting.				
d415	Maintaining a body position	Staying in the same body position as required, such as remaining seated or remaining standing for work or school.				
d420	Transferring oneself	Moving from one surface to another, such as sliding along a bench or moving from a bed to a chair, without changing body position.				
Carrying, moving and handling objects						
d430	Lifting and carrying objects	Raising up an object or taking something from one place to another, such as when lifting a cup or toy, or carrying a box or a child from one room to another.				
d435	Moving objects with lower extremities	Performing coordinated actions aimed at moving an object by using the legs and feet, such as kicking a ball or pushing pedals on a bicycle.				
d440	Fine hand use	Performing the coordinated actions of handling objects, picking up, manipulating and releasing them using one's hand, fingers and thumb, such as required to lift coins off a table or turn a dial or knob.				
d445	Hand and arm use	Performing the coordinated actions required to move objects or to manipulate them by using hands and arms, such as when turning door handles or throwing or catching an object.				
d446	Fine foot use	Performing the coordinated actions to move or manipulate objects using one's foot and toes.				
Walking and moving						

Code	Category	Description	*Very Relevant*	*Somewhat Relevant*	*Slightly Relevant*	*Not Relevant*
d450	Walking	Moving along a surface on foot, step by step, so that one foot is always on the ground, such as when strolling, sauntering, walking forwards, backwards, or sideways.				
d455	Moving around	Moving the whole body from one place to another by means other than walking, such as climbing over a rock or running down a street, skipping, scampering, jumping, somersaulting or running around obstacles.				
d460	Moving around in different locations	Walking and moving around in various places and situations, such as walking between rooms in a house, within a building, or down the street of a town.				
d465	Moving around using equipment	Moving the whole body from place to place, on any surface or space, by using specific devices designed to facilitate moving or create other ways of moving around, such as with skates, skis, scuba equipment, swim fins, or moving down the street in a wheelchair or a walker.				
Moving around using transportation						
d470	Using transportation	Using transportation to move around as a passenger, such as being driven in a car, bus, rickshaw, jitney, pram or stroller, animal-powered vehicle, private or public taxi, train, tram, subway, boat or aircraft.				
d475	Driving	Being in control of and moving a vehicle or the animal that draws it, travelling under one's own direction or having at one's disposal any form of transportation, such as a car, bicycle, boat or animal-powered vehicle.				
d480	Riding animals for transportation	Travelling on the back of an animal, such as a horse, ox, camel or elephant.				

5. Self-care

Code	Category	Description	*Very Relevant*	*Somewhat Relevant*	*Slightly Relevant*	*Not Relevant*
d510	Washing oneself	Washing and drying one's whole body, or body parts, using water and appropriate cleaning and drying materials or methods, such as bathing, showering, washing hands and feet, face and hair, and drying with a towel.				
d520	Caring for body parts	Looking afer those parts of the body, such as skin, face, teeth, scalp, nails and genitals, that require more than washing and drying.				
d530	Toileting	Indicating the need for, planning and carrying out the elimination of human waste (menstruation, urination and defecation), and cleaning oneself afterwards.				

Code	Category	Description	*Very Relevant*	*Somewhat Relevant*	*Slightly Relevant*	*Not Relevant*
d540	Dressing	Carrying out the coordinated actions and tasks of putting on and taking off clothes and footwear in sequence and in keeping with climatic and social conditions, such as by putting on, adjusting and removing shirts, skirts, blouses, pants, undergarments, saris, kimono, tights, hats, gloves, coats, shoes, boots, sandals and slippers.				
d550	Eating	Indicating need for, and carrying out the coordinated tasks and actions of eating food that has been served, bringing it to the mouth and consuming it in culturally acceptable ways, cutting or breaking food into pieces, opening bottles and cans, using eating implements, having meals, feasting or dining.				
d560	Drinking	Indicating need for, and taking hold of a drink, bringing it to the mouth and consuming the drink in culturally acceptable ways; mixing, stirring and pouring liquids for drinking, opening bottles and cans, drinking through a straw or drinking running water, such as from a tap or a spring; feeding from the breast.				
d570	Looking after one's health	Ensuring or indicating needs about physical comfort, health and physical and mental well-being, such as by maintaining a balanced diet and an appropriate level of physical activity, keeping warm or cool, avoiding harm to health, following safe sex practices, including using condoms, getting immunizations and regular physical examinations.				
d571	Looking after one's safety	Avoiding risks that can lead to physical injury or harm. Avoiding potentially hazardous situations such as misusing fire or running into traffic.				

6. Domestic life

Code	Category	Description	*Very Relevant*	*Somewhat Relevant*	*Slightly Relevant*	*Not Relevant*
Acquisition of necessities						
d610	Acquiring a place to live	Buying, renting, furnishing and arranging a room, house, apartment or other dwelling.				
d620	Acquisition of goods and services	Selecting, procuring and transporting all goods and services required for daily living, such as selecting, procuring, transporting and storing food, drink, clothing, cleaning materials, fuel, household items, utensils, cooking ware, play-material, domestic appliance and tools; procuring utilities and other household services.				
Household tasks						
d630	Preparing meals	Planning, organizing, cooking and serving simple and complex meals for oneself and others, such as by making a menu, selecting edible food and drink, getting together ingredients for preparing meals, cooking with heat and preparing cold foods and drinks, and serving the food.				

Code	Category	Description	*Very Relevant*	*Somewhat Relevant*	*Slightly Relevant*	*Not Relevant*
d640	Doing housework	Managing a household by cleaning the house, washing clothes, using household appliances, storing food and disposing of garbage, such as by sweeping, mopping, washing counters, walls and other surfaces; collecting and disposing of household garbage; tidying rooms, closets and drawers; collecting, washing, drying, folding and ironing clothes; cleaning footwear; using brooms, brushes and vacuum cleaners; using washing machines, driers and irons.				
Caring for household objects and assisting others						
d650	Caring for household objects	Maintaining and repairing household and other personal objects, including play-material, house and contents, clothes, vehicles and assistive devices, and caring for plants and animals, such as painting or wallpapering rooms, fixing furniture, repairing plumbing, ensuring the proper working order of vehicles, watering plants, grooming and feeding pets and domestic animals.				
d660	Assisting others	Assisting household members and others with their learning, communicating, self-care, movement, within the house or outside; being concerned about, or drawing other's attention to, the well-being of household members and others.				

7. Interpersonal interactions and relationships

Code	Category	Description	*Very Relevant*	*Somewhat Relevant*	*Slightly Relevant*	*Not Relevant*
General interpersonal interactions						
d710	Basic interpersonal interactions	Interacting with people in a contextually and socially appropriate manner, such as by showing consideration and esteem when appropriate, or responding to the feelings of others.				
d720	Complex interpersonal interactions	Maintaining and managing interactions with other people, in a contextually and socially appropriate manner, such as by regulating emotions and impulses, controlling verbal and physical aggression, acting independently in social interactions, and acting in accordance with social rules and conventions.				
Particular interpersonal relationships						
d730	Relating with strangers	Engaging in temporary contacts and links with strangers for specific purposes, such as when asking for information, directions or making a purchase.				
d740	Formal relationships	Creating and maintaining specific relationships in formal settings, such as with teachers, employers, professionals or service providers.				

Code	Category	Description	*Very Relevant*	*Somewhat Relevant*	*Slightly Relevant*	*Not Relevant*
d750	Informal social relationships	Entering into relationships with others, such as casual relationships with people living in the same community or residence, or with co-workers, pupils, playmates or people with similar backgrounds or professions.				
d760	Family relationships	Creating and maintaining kinship relationships, such as with members of the nuclear family, extended family, foster and adopted family and step-relationships, more distant relationships such as second cousins, or legal guardians.				
d770	Intimate relationships	Creating and maintaining close or romantic relationships between individuals, such as husband and wife, lovers or sexual partners.				

8. Major life areas

Code	Category	Description	*Very Relevant*	*Somewhat Relevant*	*Slightly Relevant*	*Not Relevant*
Education						
d810	Informal education	Learning at home or in some other non-institutional setting, such as acquiring non-academic (e.g. crafts) or academic (e.g. home-schooling) skills from parents or family member in home or community.				
d815	Preschool education	Learning at an initial level of organized instruction in the home or in the community designed primarily to introduce a child to a school-type environment and prepare the child for compulsory education, such as by acquiring skills in a day-care or similar setting in preparation for school (e.g. educational services provided in the home or in community settings designed to promote health and cognitive, motor, language and social development and readiness skills for formal education).				
d816	Preschool life and related activities	Engaging in preschool life and related activities, such as excursions and celebrations.				
d820	School education	Gaining admission to school, education; engaging in all school-related responsibilities and privileges; learning the course material, subjects and other curriculum requirements in a primary or secondary education programme, including attending school regularly; working cooperatively with other pupils, taking direction from teachers, organizing, studying and completing assigned tasks and projects, and advancing to other stages of education.				
d825	Vocational training	Engaging in all activities of a vocational programme and learning the curriculum material in preparation for employment in a trade, job or profession.				

Code	Category	Description	*Very Relevant*	*Somewhat Relevant*	*Slightly Relevant*	*Not Relevant*
d830	Higher education	Engaging in the activities of advanced educational programmes in universities, colleges and professional schools and learning all aspects of the curriculum required for degrees, diplomas, certificates and other accreditations, such as completing a university bachelor's or master's course of study, medical school or other professional school.				
d835	School life and related activities	Engaging in aspects of school life and school-related associations, such as student council and student officer.				
Work and employment						
d840	Apprenticeship (work preparation)	Engaging in programmes related to preparation for employment, such as performing the tasks required of an apprenticeship, internship, articling and inservice training.				
d845	Acquiring, keeping and terminating a job	Seeking, finding and choosing employment, being hired and accepting employment, maintaining and advancing through a job, trade, occupation or profession, and leaving a job in an appropriate manner.				
d850	Remunerative employment	Engaging in all aspects of work, as an occupation, trade, profession or other form of employment, for payment, as an employee, full or part time, or self-employed, such as seeking employment and getting a job, doing the required tasks of the job, attending work on time as required, supervising other workers or being supervised, and performing required tasks alone or in groups.				
d855	Non-remunerative employment	Engaging in all aspects of work in which pay is not provided, full-time or part-time, including organized work activities, doing the required tasks of the job, attending work on time as required, supervising other workers or being supervised, and performing required tasks alone or in groups, such as volunteer work, charity work, working for a community or religious group without remuneration, working around the home without remuneration.				
Economic life						
d860	Basic economic transactions	Engaging in any form of simple economic transaction, such as using money to purchase food or bartering, exchanging goods or services; or saving money.				
d865	Complex economic transactions	Engaging in any form of complex economic transaction that involves the exchange of capital or property, and the creation of profit or economic value, such as buying a business, factory, or equipment, maintaining a bank account, or trading in commodities.				
d870	Economic self-sufficiency	Having command over economic resources, from private or public sources, in order to ensure economic security for present and future needs.				
d880	Engagement in play	Purposeful, sustained engagement in activities with objects, toys, materials or games, occupying oneself or with others.				

9. Community, social and civic life

Code	Category	Description	*Very Relevant*	*Somewhat Relevant*	*Slightly Relevant*	*Not Relevant*
d910	Community life	Engaging in aspects of community social life, such as engaging in charitable organizations, service clubs or professional social organizations.				
d920	Recreation and leisure	Engaging in any form of play, recreational or leisure activity, such as informal or organized play and sports, programmes of physical fitness, relaxation, amusement or diversion, going to art galleries, museums, cinemas or theatres; engaging in crafts or hobbies, reading for enjoyment, playing musical instruments; sightseeing, tourism and travelling for pleasure.				
d930	Religion and spirituality	Engaging in religious or spiritual activities, organizations and practices for selffulfilment, finding meaning, religious or spiritual value and establishing connection with a divine power, such as is involved in attending a church, temple, mosque or synagogue, praying or chanting for a religious purpose, and spiritual contemplation.				
d940	Human rights	Enjoying all nationally and internationally recognized rights that are accorded to people by virtue of their humanity alone, such as human rights as recognized by the United Nations Universal Declaration of Human Rights (1948) and the United Nations Standard Rules for the Equalization of Opportunities for Persons with Disabilities (1993); the United Nations Convention on the Rights of the Child (1989); the right to self-determination or autonomy; and the right to control over one's destiny.				
d950	Political life and citizenship	Engaging in the social, political and governmental life of a citizen, having legal status as a citizen and enjoying the rights, protections, privileges and duties associated with that role, such as the right to vote and run for political office, to form political associations; enjoying the rights and freedoms associated with citizenship (e.g. the rights of freedom of speech, association, religion, protection against unreasonable search and seizure, the right to counsel, to a trial and other legal rights and protection against discrimination); having legal standing as a citizen.				

[Environmental Factors]

The following are the categories and codes in the Environmental Factors domain of the ICF-CY. Please mark with a ✓ either ***Very Relevant***, ***Somewhat Relevant***, ***Slightly Relevant***, or ***Not Relevant*** in the appropriate columns depending on ***the extent of relevance to facilitating or hindering performance of pupils aged 3–5 years with physical disabilities.*** In this questionnaire, the range of physical disabilities includes limitations in sustaining the trunk or moving the limbs and cerebral palsy. For example, in "Design, construction and building products and technology of buildings for public use (e150)," if you think that the performance of pupils aged 3 to 5 years with physical disabilities is very hindered or facilitated due to the design of public buildings (such as a preschool building), you would check Very Relevant; if you think the performance is somewhat hindered or facilitated, you would check Somewhat Relevant; if you think the performance is slightly hindered or facilitated, you would check Slightly Relevant; if you think the performance is absolutely not hindered or facilitated, you would check Not Relevant. In addition to ***physical disabilities***, you must consider the ***developmental characteristics of early childhood*** at age 3–5 years when you make your choice. (Please choose only one option for each category or code according to your professional or parental opinion about environmental factors influencing the performance of pupils with physical disabilities in the 3–5 age group.)

1. Products and technology

Code	Category	Description	*Very Relevant*	*Somewhat Relevant*	*Slightly Relevant*	*Not Relevant*
e110	Products or substances for personal consumption	Any natural or human-made object or substance gathered, processed or manufactured for ingestion.				
e115	Products and technology for personal use in daily living	Equipment, products and technologies used by people in daily activities, including those adapted or specially designed, located in, on or near the person using them.				
e120	Products and technology for personal indoor and outdoor mobility and transportation	Equipment, products and technologies used by people in activities of moving inside and outside buildings, including those adapted or specially designed, located in, on or near the person using them.				
e125	Products and technology for communication	Equipment, products and technologies used by people in activities of sending and receiving information, including those adapted or specially designed, located in, on or near the person using them.				

Code	Category	Description	*Very Relevant*	*Somewhat Relevant*	*Slightly Relevant*	*Not Relevant*
e130	Products and technology for education	Equipment, products, processes, methods and technology used for acquisition of knowledge, expertise or skill, including those adapted or specially designed.				
e135	Products and technology for employment	Equipment, products and technology used for employment to facilitate work activities.				
e140	Products and technology for culture, recreation and sport	Equipment, products and technology used for the conduct and enhancement of cultural, recreational and sporting activities, including those adapted or specially designed.				
e145	Products and technology for the practice of religion and spirituality	Products and technology, unique or mass-produced, that are given or take on a symbolic meaning in the context of the practice of religion or spirituality, including those adapted or specially designed.				
e150	Design, construction and building products and technology of buildings for public use	Products and technology that constitute an individual's indoor and outdoor human-made environment that is planned, designed and constructed for public use, including those adapted or specially designed.				
e155	Design, construction and building products and technology of buildings for private use	Products and technology that constitute an individual's indoor and outdoor human-made environment that is planned, designed and constructed for private use (e.g. home, dwelling), including those adapted or specially designed.				
e160	Products and technology of land development	Products and technology of land areas, as they affect an individual's outdoor environment through the implementation of land use policies, design, planning and development of space, including those adapted or specially designed.				
e165	Assets	Products or objects of economic exchange such as money, goods, property and other valuables that an individual owns or of which he or she has rights of use or rights of benefit, such as child support payment or wills for children or dependent persons.				

2. Natural environment and human-made changes to environment

Code	Category	Description	*Very Relevant*	*Somewhat Relevant*	*Slightly Relevant*	*Not Relevant*
e210	Physical geography	Features of land forms and bodies of water.				
e215	Population	Groups of people living in a given environment who share the same pattern of environmental adaptation.				
e220	Flora and fauna	Plants and animals.				
e225	Climate	Meteorological features and events, such as the weather.				
e230	Natural events	Geographic and atmospheric changes that cause disruption in an individual's physical environment, occurring regularly or irregularly, such as earthquakes and severe or violent weather conditions, e.g. tornadoes, hurricanes, typhoons, floods, forest fires and ice-storms.				
e235	Human-caused events	Alterations or disturbances in the natural environment, caused by humans, that may result in the disruption of people's day-to-day lives, including events or conditions linked to conflict and wars, such as the displacement of people, destruction of social infrastructure, homes and lands, environmental disasters and land, water or air pollution (e.g. toxic spills).				
e240	Light	Electromagnetic radiation by which things are made visible by either sunlight or artificial lighting (e.g. candles, oil or paraffin lamps, fires and electricity), and which may provide useful or distracting information about the world.				
e245	Time-related changes	Natural, regular or predictable temporal change.				
e250	Sound	A phenomenon that is or may be heard, such as banging, ringing, thumping, singing, whistling, yelling or buzzing, in any volume, timbre or tone, and that may provide useful or distracting information about the world.				
e255	Vibration	Regular or irregular to and fro motion of an object or an individual caused by a physical disturbance, such as shaking, quivering, quick jerky movements of things, buildings or people caused by small or large equipment, aircraft and explosions.				
e260	Air quality	Characteristics of the atmosphere (outside buildings) or enclosed areas of air (inside buildings), and which may provide useful or distracting information about the world.				

3. Support and relationships

Code	Category	Description	*Very Relevant*	*Somewhat Relevant*	*Slightly Relevant*	*Not Relevant*
e310	Immediate family	Individuals related by birth, marriage or other relationship recognized by the culture as immediate family, such as spouses, partners, parents, siblings, children, foster parents, adoptive parents and grandparents.				
e315	Extended family	Individuals related through family or marriage or other relationships recognized by the culture as extended family, such as aunts, uncles, nephews and nieces.				
e320	Friends	Individuals who are close and ongoing participants in relationships characterized by trust and mutual support.				
e325	Acquaintances, peers, colleagues, neighbours and community members	Individuals who are familiar to each other as acquaintances, peers, colleagues, neighbours, and community members, in situations of work, school, recreation, or other aspects of life, and who share demographic features such as age, gender, religious creed or ethnicity or pursue common interests.				
e330	People in positions of authority	Individuals who have decision-making responsibilities for others and who have socially defined influence or power based on their social, economic, cultural or religious roles in society, such as teachers, employers, supervisors, religious leaders, substitute decision-makers, guardians or trustees.				
e335	People in subordinate positions	Individuals whose day-to-day life is influenced by people in positions of authority in work, school or other settings, such as pupils, workers and members of a religious group.				
e340	Personal care providers and personal assistants	Individuals who provide services as required to support individuals in their daily activities and maintenance of performance at work, education or other life situation, provided either through public or private funds, or else on a voluntary basis, such as providers of support for home-making and maintenance, personal assistants, transport assistants, paid help, nannies and others who function as primary caregivers.				

Code	Category	Description	*Very Relevant*	*Somewhat Relevant*	*Slightly Relevant*	*Not Relevant*
e345	Strangers	Individuals who are unfamiliar and unrelated, or those who have not yet established a relationship or association, including persons unknown to the individual but who are sharing a life situation with them, such as substitute teachers co-workers or care providers.				
e350	Domesticated animals	Animals that provide physical, emotional, or psychological support, such as pets (dogs, cats, birds, fish, etc.) and animals for personal mobility and transportation.				
e355	Health professionals	All service providers working within the context of the health system, such as doctors, nurses, physiotherapists, occupational therapists, speech therapists, audiologists, orthotist-prosthetists, medical social workers.				
e360	Other professionals	All service providers working outside the health system, including social workers, lawyers, teachers, architects, and designers.				

4. Attitudes

Code	Category	Description	*Very Relevant*	*Somewhat Relevant*	*Slightly Relevant*	*Not Relevant*
e410	Individual attitudes of immediate family members	General or specific opinions and beliefs of immediate family members about the person or about other matters (e.g. social, political and economic issues), that influence individual behaviour and actions.				
e415	Individual attitudes of extended family members	General or specific opinions and beliefs of extended family members about the person or about other matters (e.g. social, political and economic issues), that influence individual behaviour and actions.				
e420	Individual attitudes of friends	General or specific opinions and beliefs of friends about the person or about other matters (e.g. social, political and economic issues), that influence individual behaviour and actions.				
e425	Individual attitudes of acquaintances, peers, colleagues, neighbours and community members	General or specific opinions and beliefs of acquaintances, peers, colleagues, neighbours and community members about the person or about other matters (e.g. social, political and economic issues), that influence individual behaviour and actions.				
e430	Individual attitudes of people in positions of authority	General or specific opinions and beliefs of people in positions of authority about the person or about other matters (e.g. social, political and economic issues), that influence individual behaviour and actions.				

Code	Category	Description	*Very Relevant*	*Somewhat Relevant*	*Slightly Relevant*	*Not Relevant*
e435	Individual attitudes of people in subordinate positions	General or specific opinions and beliefs of people in subordinate positions about the person or about other matters (e.g. social, political and economic issues), that influence individual behaviour and actions.				
e440	Individual attitudes of personal care providers and personal assistants	General or specific opinions and beliefs of personal care providers and personal assistants about the person or about other matters (e.g. social, political and economic issues), that influence individual behaviour and actions.				
e445	Individual attitudes of strangers	General or specific opinions and beliefs of strangers about the person or about other matters (e.g. social, political and economic issues), that influence individual behaviour and actions.				
e450	Individual attitudes of health professionals	General or specific opinions and beliefs of health professionals about the person or about other matters (e.g. social, political and economic issues), that influence individual behaviour and actions.				
e455	Individual attitudes of other professionals	General or specific opinions and beliefs of health-related and other professionals about the person or about other matters (e.g. social, political and economic issues), that influence individual behaviour and actions.				
e460	Societal attitudes	General or specific opinions and beliefs generally held by people of a culture, society, subcultural or other social group about other individuals or about other social, political and economic issues, that influence group or individual behavior and actions.				
e465	Social norms, practices and ideologies	Customs, practices, rules and abstract systems of values and normative beliefs (e.g. ideologies, normative world views and moral philosophies) that arise within social contexts and that affect or create societal and individual practices and behaviours, such as social norms of moral and religious behaviour or etiquette; religious doctrine and resulting norms and practices; norms governing rituals or social gatherings.				

5. Services, systems and policies

Code	Category	Description	*Very Relevant*	*Somewhat Relevant*	*Slightly Relevant*	*Not Relevant*
e510	Services, systems and policies for the production of consumer goods	Services, systems and policies that govern and provide for the production of objects and products consumed or used by people.				
e515	Architecture and construction services, systems and policies	Services, systems and policies for the design and construction of buildings, public and private.				
e520	Open space planning services, systems and policies	Services, systems and policies for the planning, design, development and maintenance of public lands, (e.g. parks, forests, shorelines, wetlands) and private lands in the rural, suburban and urban context.				
e525	Housing services, systems and policies	Services, systems and policies for the provision of shelters, dwellings or lodging for people.				
e530	Utilities services, systems and policies	Services, systems and policies for publicly provided utilities, such as water, fuel, electricity, sanitation, public transportation and essential services.				
e535	Communication services, systems and policies	Services, systems and policies for the transmission and exchange of information.				
e540	Transportation services, systems and policies	Services, systems and policies for enabling people or goods to move or be moved from one location to another.				
e545	Civil protection services, systems and policies	Services, systems and policies aimed at safeguarding people and property.				
e550	Legal services, systems and policies	Services, systems and policies concerning the legislation and other law of a country.				
e555	Associations and organizational services, systems and policies	Services, systems and policies relating to groups of people who have joined together in the pursuit of common, noncommercial interests, often with an associated membership structure.				
e560	Media services, systems and policies	Services, systems and policies for the provision of mass communication through radio, television, newspapers and internet.				
e565	Economic services, systems and policies	Services, systems and policies related to the overall system of production, distribution, consumption and use of goods and services.				
e570	Social security services, systems and policies	Services, systems and policies aimed at providing income support to people who, because of age, poverty, unemployment, health condition or disability, require public assistance that is funded either by general tax revenues or contributory schemes.				

Code	Category	Description	*Very Relevant*	*Somewhat Relevant*	*Slightly Relevant*	*Not Relevant*
e575	General social support services, systems and policies	Services, systems and policies aimed at providing support to those requiring assistance in areas such as shopping, housework, transport, child care, respite care, self-care and care of others, in order to function more fully in society.				
e580	Health services, systems and policies	Services, systems and policies for preventing and treating health problems, providing medical rehabilitation and promoting a healthy lifestyle.				
e585	Education and training services, systems and policies	Services, systems and policies for the acquisition, maintenance and improvement of knowledge, expertise and vocational or artistic skills. See UNESCO's International Standard Classification of Education (ISCED-1997).				
e590	Labour and employment services, systems and policies	Services, systems and policies related to finding suitable work for persons who are unemployed or looking for different work, or to support individuals already employed who are seeking promotion.				
e595	Political services, systems and policies	Services, systems and policies related to voting, elections and governance of countries, regions and communities, as well as international organizations.				

Thank you for your cooperation!

Appendix E: Second Round Questionnaire on Activities & Participation and Environmental Factors

Second Round Questionnaire of Activities & Participation and Environmental Factors

Number of Panel	
Target Age Group	**3–5 age group**

Expert Delphi Survey to Identify Classification Codes for Pupils with Physical Disabilities from the *International Classification of Functioning, Disability and Health, for Children and Youth* (ICF-CY)

Dear (Special Educators, Professors, or Parents),

This survey is being conducted for my master's study and as part of a research project of the Korean Solidarity for Human Rights of Disabled People with Brain Lesions (KSHB) (Researcher Sangwon Yoon, Master's Student at University of Oslo and Temporary Researcher of KSHB). The purpose of this research is to identify the most relevant classification items/codes of the International Classification of Functioning, Disability and Health, for Children and Youth (ICF-CY) to assess and support functioning of pupils with physical disabilities, including cerebral palsy (CP).

The ICF-CY, approved by the World Health Organization (WHO) in 2007, is the first universal classification system to document functioning and disability of children and youth from a perspective of individual and environmental factors. It not only offers a common language of functioning and disability in childhood and adolescence across disciplines and nations, but it also provides comprehensive information about both the individual and environmental factors that influence an individual child's functioning. That is, the ICF-CY overcomes the medical model in which disability is viewed only as the result of individual disease or deficit, and it also provides an internationally common classification system to record childhood health and functioning from a holistic bio-psycho-social perspective.

The aim of this survey is to request your professional or parental opinion about the most appropriate codes in the Activities & Participation and Environmental Factors domains of the ICF-CY for pupils with physical disabilities, including CP, in three age groups: 3–5, 6–12, and 13–18 years old. Your honest response to every item will be helpful to this study.

Please understand that although the ICF-CY is a universally applicable classification system for all countries, there may be awkward expressions and unfamiliar categories or codes as a result of translating the terms from Korean into English. All responses will be kept confidential by applicable law, and survey results will not be used for any purpose other than this research.

Thank you for your cooperation.

♠ If you have questions about the survey, please contact us below.
- Researcher: Sangwon Yoon (Master's Student at University of Oslo & Temporary Researcher of KSHB)
- Tel: XXX-XXX-XXXX
- E-mail: XXXXXX@XXXX.XXX

Department of Special Needs Education
University of Oslo

Korean Solidarity for Human Rights of
Disabled People with Brain Lesions

[Activities & Participation]

On the basis of the first-round survey results, the following are the most relevant categories or codes for the Activities and Participation domain of the ICF-CY concerning performance of pupils with physical disabilities aged 3–5 years. The numerical value representing the degree of relevance for each code is interpreted as follows: values closer to 3.00 indicate lower relevance, and values closer to 1.00 indicate higher relevance. For instance, respondents to the first survey, including parents, generally agreed that "d 415 Maintaining a body position" (average relevance value 1.20) is more likely to influence the performance of physically disabled pupils aged 3–5 years than would "D115 Listening" (average relevance value 2.60).

After considering the consensus on relevance among expert respondents to the first survey, please mark with a ✓either ***Very Appropriate***, ***Somewhat Appropriate***, ***Slightly Appropriate***, or ***Not Appropriate*** in the columns below depending on ***the extent of an item's appropriateness to assess functioning of pupils aged 3–5 years with physical disabilities for special education services***. For example, if you think the code item of "d440 Fine hand use" is very necessary and appropriate to assess and support functioning of pupils aged 3 to 5 years with physical disabilities so as to facilitate their performance in special education services, you would check Very Appropriate; if you think the code item is somewhat useful, you would check Somewhat Appropriate; if you think the code item is of slight use, you would check Slightly Appropriate; and if you think the code item is absolutely not useful, you would check Not Appropriate. In addition to ***physical disabilities***, you must consider the ***developmental characteristics of early childhood*** at age 3–5 years when you make your choice. (Please choose only one option for each category or code according to your professional or parental opinion about activities or participation of pupils with physical disabilities in the 3–5 age group.)

Results of the first-round survey are summarized as follows:

- The total average relevance value of all category codes in the Activities and Participation domain was 2.84. The category code items for "d4 Mobility" were considered very relevant, with an average relevance value of 1.89; followed by "d5 Self-care" (2.41), "d3 Communication" (2.75), "d1 Learning and applying knowledge" (2.85), "d7 Interpersonal interactions and relationships" (3.13), and "d9 Community, social, and civic life" (3.64).
- Category code items with a mean value of 3 points or more in the first survey results were excluded on this second-round questionnaire. However, on the last section of this questionnaire you may suggest an opinion on why the excluded items should be included and considered relevant and appropriate assessment items for pupils with physical disabilities. Any excluded items that you think relevant and appropriate will be included again on the last-round questionnaire.

1. Learning and applying knowledge (Total Average of Code Items in Chapter "d1": 2.82)

Code	Category	Description	Relevant Degree	*Very Appropriate*	*Somewhat Appropriate*	*Slightly Appropriate*	*No Appropriate*
Purposeful sensory experiences							
d110	Watching	Using the sense of seeing intentionally to experience visual stimuli, such as visually tracking an object, watching persons, looking at a sporting event, person, or children playing.	**2.10**				

Code	Category	Description	Relevant Degree	*Very Appropriate*	*Somewhat Appropriate*	*Slightly Appropriate*	*No Appropriate*
d115	Listening	Using the sense of hearing intentionally to experience auditory stimuli, such as listening to a radio, the human voice, to music, a lecture, or to a story told.	**2.60**				
d120	Other purposeful sensing	Using the body's other basic senses intentionally to experience stimuli, such as touching and feeling textures, tasting sweets or smelling flowers.	**2.50**				
Basic learning							
d130	Copying	Imitating or mimicking as a basic component of learning, such as copying, repeating a facial expression, a gesture, a sound or the letters of an alphabet.	**1.60**				
d131	Learning through actions with objects	Learning through simple actions on a single object, two or more objects, symbolic and pretend play, such as in hitting an object, banging blocks and playing with dolls or cars.	**1.40**				
d132	Acquiring information	Obtaining facts about persons, things and events, such as asking why, what, where and how, asking for names.	**2.10**				
d133	Acquiring language	Developing the competence to represent persons, objects, events and feelings through words, symbols, phrases and sentences.	**2.10**				
d135	Rehearsing	Repeating a sequence of events or symbols as a basic component of learning, such as counting by tens or practising the recitation of a rhyme with gestures, counting by tens or practising the recitation of a poem.	**2.30**				
d137	Acquiring concepts	Developing competence to understand and use basic and complex concepts related to the characteristics of things, persons or events.	**2.40**				
d155	Acquiring skills	Developing basic and complex competencies in integrated sets of actions or tasks so as to initiate and follow through with the acquisition of a skill, such as manipulating tools or toys, or playing games.	**2.70**				
Applying Knowledge							
d160	Focusing attention	Intentionally focusing on specific stimuli, such as by filtering out distracting noises.	**2.40**				
d161	Directing attention	Intentionally maintaining attention to specific actions or tasks for an appropriate length of time.	**2.30**				

2. General tasks and demands (Total Average of Code Items in Chapter "d2": 3.22)

Code	Category	Description	Relevant Degree	*Very Appropriate*	*Somewhat Appropriate*	*Slightly Appropriate*	*No Appropriate*
d210	Undertaking a single task	Carrying out simple or complex and coordinated actions related to the mental and physical components of a single task, such as initiating a task, organizing time, space and materials for a task, pacing task performance, and carrying out, completing and sustaining a task.	**2.20**				

3. Communication (Total Average of Code Items in Chapter "d3": 2.75)

Code	Category	Description	Relevant Degree	*Very Appropriate*	*Somewhat Appropriate*	*Slightly Appropriate*	*No Appropriate*
Communicating - receiving							
d310	Communicating with - receiving - spoken messages	Comprehending literal and implied meanings of messages in spoken language, such as understanding that a statement asserts a fact or is an idiomatic expression, such as responding and comprehending spoken messages.	**2.10**				
d315	Communicating with - receiving - nonverbal messages	Comprehending the literal and implied meanings of messages conveyed by gestures, symbols and drawings, such as realizing that a child is tired when she rubs her eyes or that a warning bell means that there is a fire.	**1.90**				
Communicating - Producing							
d330	Speaking	Producing words, phrases and longer passages in spoken messages with literal and implied meaning, such as expressing a fact or telling a story in oral language.	**2.00**				
d331	Pre-talking	Vocalizing when aware of another person in the proximal environment, such as producing sounds when the mother is close; babbling; babbling in turn-taking activities. Vocalizing in response to speech through imitating speech-sounds in a turn taking procedure.	**2.20**				
d332	Singing	Producing tones in a sequence resulting in a melody or performing songs on one's own or in a group.	**2.40**				
d335	Producing nonverbal messages	Using gestures, symbols and drawings to convey messages, such as shaking one's head to indicate disagreement or drawing a picture or diagram to convey a fact or complex idea.	**1.70**				
Conversation and use of communication devices and techniques							
d350	Conversation	Starting, sustaining and ending an interchange of thoughts and ideas, carried out by means of spoken, written, sign or other forms of language, with on	**1.70**				

Code	Category	Description	Relevant Degree	*Very Appropriate*	*Somewhat Appropriate*	*Slightly Appropriate*	*No Appropriate*
d355	Discussion	Starting, sustaining and ending an examination of a matter, with arguments for or against, or debate carried out by means of spoken, written, sign or other forms of language, with one or more people one knows or who are strangers, in formal or casual settings.	**2.90**				

4. Mobility (Total Average of Code Items in Chapter "d4": 1.89)

Code	Category	Description	Relevant Degree	*Very Appropriate*	*Somewhat Appropriate*	*Slightly Appropriate*	*No Appropriate*
Changing and maintaining body position							
d410	Changing basic body position	Getting into and out of a body position and moving from one location to another, such as rolling from one side to the other, sitting, standing, getting up out of a chair to lie down on a bed, and getting into and out of positions of kneeling or squatting.	**1.30**				
d415	Maintaining a body position	Staying in the same body position as required, such as remaining seated or remaining standing for work or school.	**1.20**				
d420	Transferring oneself	Moving from one surface to another, such as sliding along a bench or moving from a bed to a chair, without changing body position.	**1.30**				
Carrying, moving and handling objects							
d430	Lifting and carrying objects	Raising up an object or taking something from one place to another, such as when lifting a cup or toy, or carrying a box or a child from one room to another.	**1.40**				
d435	Moving objects with lower extremities	Performing coordinated actions aimed at moving an object by using the legs and feet, such as kicking a ball or pushing pedals on a bicycle.	**1.40**				
d440	Fine hand use	Performing the coordinated actions of handling objects, picking up, manipulating and releasing them using one's hand, fingers and thumb, such as required to lift coins off a table or turn a dial or knob.	**1.50**				
d445	Hand and arm use	Performing the coordinated actions required to move objects or to manipulate them by using hands and arms, such as when turning door handles or throwing or catching an object.	**1.50**				
d446	Fine foot use	Performing the coordinated actions to move or manipulate objects using one's foot and toes.	**2.00**				
Walking and moving							

Code	Category	Description	Relevant Degree	*Very Appropriate*	*Somewhat Appropriate*	*Slightly Appropriate*	*No Appropriate*
d450	Walking	Moving along a surface on foot, step by step, so that one foot is always on the ground, such as when strolling, sauntering, walking forwards, backwards, or sideways.	**1.40**				
d455	Moving around	Moving the whole body from one place to another by means other than walking, such as climbing over a rock or running down a street, skipping, scampering, jumping, somersaulting or running around obstacles.	**1.60**				
d460	Moving around in different locations	Walking and moving around in various places and situations, such as walking between rooms in a house, within a building, or down the street of a town.	**1.70**				
d465	Moving around using equipment	Moving the whole body from place to place, on any surface or space, by using specific devices designed to facilitate moving or create other ways of moving around, such as with skates, skis, scuba equipment, swim fins, or moving down the street in a wheelchair or a walker.	**2.00**				
Moving around using transportation							
d470	Using transportation	Using transportation to move around as a passenger, such as being driven in a car, bus, rickshaw, jitney, pram or stroller, animal-powered vehicle, private or public taxi, train, tram, subway, boat or aircraft.	**2.90**				

5. Self-care (Total Average of Code Items in Chapter "d5": 2.41)

Code	Category	Description	Relevant Degree	*Very Appropriate*	*Somewhat Appropriate*	*Slightly Appropriate*	*No Appropriate*
d510	Washing oneself	Washing and drying one's whole body, or body parts, using water and appropriate cleaning and drying materials or methods, such as bathing, showering, washing hands and feet, face and hair, and drying with a towel.	**2.50**				
d520	Caring for body parts	Looking after those parts of the body, such as skin, face, teeth, scalp, nails and genitals, that require more than washing and drying.	**2.70**				
d530	Toileting	Indicating the need for, planning and carrying out the elimination of human waste (menstruation, urination and defecation), and cleaning oneself afterwards.	**1.30**				
d540	Dressing	Carrying out the coordinated actions and tasks of putting on and taking off clothes and footwear in sequence and in keeping with climatic and social conditions, such as by putting on, adjusting and removing shirts, skirts, blouses, pants, undergarments, saris, kimono, tights, hats, gloves, coats, shoes, boots, sandals and slippers.	**2.50**				

Code	Category	Description	Relevant Degree	*Very Appropriate*	*Somewhat Appropriate*	*Slightly Appropriate*	*No Appropriate*
d550	Eating	Indicating need for, and carrying out the coordinated tasks and actions of eating food that has been served, bringing it to the mouth and consuming it in culturally acceptable ways, cutting or breaking food into pieces, opening bottles and cans, using eating implements, having meals, feasting or dining.	**1.80**				
d560	Drinking	Indicating need for, and taking hold of a drink, bringing it to the mouth and consuming the drink in culturally acceptable ways; mixing, stirring and pouring liquids for drinking, opening bottles and cans, drinking through a straw or drinking running water, such as from a tap or a spring; feeding from the breast.	**1.90**				

6. Domestic life (Total Average of Code Items in Chapter "d6": 3.72, All codes were excluded)

7. Interpersonal interactions and relationships (Total Average of Code Items in Chapter "d7": 3.13)

Code	Category	Description	Relevant Degree	*Very Appropriate*	*Somewhat Appropriate*	*Slightly Appropriate*	*No Appropriate*
General interpersonal interactions							
d710	Basic interpersonal interactions	Interacting with people in a contextually and socially appropriate manner, such as by showing consideration and esteem when appropriate, or responding to the feelings of others.	**2.20**				
Particular interpersonal relationships							
d750	Informal social relationships	Entering into relationships with others, such as casual relationships with people living in the same community or residence, or with co-workers, pupils, playmates or people with similar backgrounds or professions.	**2.90**				

8. Major life areas (Total Average of Code Items in Chapter "d8": 3.25)

Code	Category	Description	Relevant Degree	*Very Appropriate*	*Somewhat Appropriate*	*Slightly Appropriate*	*No Appropriate*
Education							
d810	Informal education	Learning at home or in some other non-institutional setting, such as acquiring non-academic (e.g. crafts) or academic (e.g. home-schooling) skills from parents or family member in home or community.	**2.40**				

Code	Category	Description	Relevant Degree	*Very Appropriate*	*Somewhat Appropriate*	*Slightly Appropriate*	*No Appropriate*
d815	Preschool education	Learning at an initial level of organized instruction in the home or in the community designed primarily to introduce a child to a school-type environment and prepare the child for compulsory education, such as by acquiring skills in a day-care or similar setting in preparation for school (e.g. educational services provided in the home or in community settings designed to promote health and cognitive, motor, language and social development and readiness skills for formal education).	**1.30**				
d816	Preschool life and related activities	Engaging in preschool life and related activities, such as excursions and celebrations.	**1.10**				
Economic life							
d880	Engagement in play	Purposeful, sustained engagement in activities with objects, toys, materials or games, occupying oneself or with others.	**1.40**				

9. Community, social and civic life (Total Average of Code Items in Chapter "d9": 3.64, All codes were excluded)

[Environmental Factors]

On the basis of the first-round survey results, the following are the most relevant categories or codes for the Environmental Factors domain of the ICF-CY concerning performance of pupils aged 3–5 years with physical disabilities. The numerical value representing the degree of relevance for each code is interpreted as follows: values closer to 3.00 indicate lower relevance, and values closer to 1.00 indicate higher relevance. For example, respondents to the first survey, including parents, generally agreed that "e410 Individual attitudes of immediate family members" (average relevance value 1.30) tends to have a greater effect on facilitating or hindering the performance of physically disabled pupils aged 3–5 years than does "e260 Air quality" (average relevance value 2.90).

After considering the degree of consensus on relevance among expert respondents in the first survey, please mark with a ✓either ***Very Appropriate***, ***Somewhat Appropriate***, ***Slightly Appropriate***, or ***Not Appropriate*** in the columns below depending on ***the extent of an item's appropriateness to assess environmental factors facilitating or hindering performance of pupils with physical disabilities aged 3–5 years for special education services***. For example, if you think the environmental factor "e120 Products and technology that constitute an individual's indoor and outdoor human-made environment that is planned, designed and constructed for public use, including those adapted or specially designed" is very appropriate and necessary to assess and support functioning of pupils with physical disabilities aged 3–5 years to facilitate their daily performance in special education services, you would check Very Appropriate; if you think the item is somewhat useful, you would check Somewhat Appropriate; if you think the category item is slightly useful, you would check Slightly Appropriate; and if you think the performance is absolutely not useful, you would check Not Appropriate. In addition to ***physical disabilities***, you must consider the ***developmental characteristics of early childhood*** at 3–5 years when you make your choice. (Please choose only one option for each category or code according to your own direct experience or professional opinion about environmental factors influencing the performance of pupils with physical disabilities in the 3–5 age group.)

Results of the first-round survey are summarized as follows:

- The total average relevance of all category code items in the Environmental Factors domain was 2.60. The category code item "e1 Products and technology" was somewhat relevant, with an average relevance value of 2.30; followed by "e4 Attitudes" (2.44), "e3 Support and relationships" (2.54), "e5 Services, systems, and policies" (2.69), and "e2 Natural environment and human-made changes to environment" (3.02).
- Category code items with mean value of 3 points or more in the first survey results were excluded on this second-round questionnaire. However, at the end of this questionnaire you may suggest an opinion on why the excluded items should be included. Any excluded items that you think relevant and appropriate will be included again on the last round-questionnaire.

1. Products and technology (Total Average of Code Items in Chapter "e1": 2.30)

Code	Category	Description	Relevant Degree	*Very Appropriate*	*Somewhat Appropriate*	*Slightly Appropriate*	*No Appropriate*
e110	Products or substances for personal consumption	Any natural or human-made object or substance gathered, processed or manufactured for ingestion.	**2.30**				

Code	Category	Description	Relevant Degree	*Very Appropriate*	*Somewhat Appropriate*	*Slightly Appropriate*	*No Appropriate*
e115	Products and technology for personal use in daily living	Equipment, products and technologies used by people in daily activities, including those adapted or specially designed, located in, on or near the person using them.	**1.50**				
e120	Products and technology for personal indoor and outdoor mobility and transportation	Equipment, products and technologies used by people in activities of moving inside and outside buildings, including those adapted or specially designed, located in, on or near the person using them.	**1.50**				
e125	Products and technology for communication	Equipment, products and technologies used by people in activities of sending and receiving information, including those adapted or specially designed, located in, on or near the person using them.	**2.00**				
e130	Products and technology for education	Equipment, products, processes, methods and technology used for acquisition of knowledge, expertise or skill, including those adapted or specially designed.	**1.60**				
e140	Products and technology for culture, recreation and sport	Equipment, products and technology used for the conduct and enhancement of cultural, recreational and sporting activities, including those adapted or specially designed.	**2.30**				
e150	Design, construction and building products and technology of buildings for public use	Products and technology that constitute an individual's indoor and outdoor human-made environment that is planned, designed and constructed for public use, including those adapted or specially designed.	**1.90**				
e155	Design, construction and building products and technology of buildings for private use	Products and technology that constitute an individual's indoor and outdoor human-made environment that is planned, designed and constructed for private use (e.g. home, dwelling), including those adapted or specially designed.	**1.80**				
e160	Products and technology of land development	Products and technology of land areas, as they affect an individual's outdoor environment through the implementation of land use policies, design, planning and development of space, including those adapted or specially designed.	**2.20**				

2. Natural environment and human-made changes to environment (Total Average of Code Items in Chapter "e2": 3.02)

Code	Category	Description	Relevant Degree	*Very Appropriate*	*Somewhat Appropriate*	*Slightly Appropriate*	*No Appropriate*
e225	Climate	Meteorological features and events, such as the weather.	**2.90**				
e240	Light	Electromagnetic radiation by which things are made visible by either sunlight or artificial lighting (e.g. candles, oil or paraffin lamps, fires and electricity), and which may provide useful or distracting information about the world.	**2.90**				
e245	Time-related changes	Natural, regular or predictable temporal change.	**2.80**				
e250	Sound	A phenomenon that is or may be heard, such as banging, ringing, thumping, singing, whistling, yelling or buzzing, in any volume, timbre or tone, and that may provide useful or distracting information about the world.	**2.70**				
e260	Air quality	Characteristics of the atmosphere (outside buildings) or enclosed areas of air (inside buildings), and which may provide useful or distracting information about the world.	**2.90**				

3. Support and relationships (Total Average of Code Items in Chapter "e3": 2.54)

Code	Category	Description	Relevant Degree	*Very Appropriate*	*Somewhat Appropriate*	*Slightly Appropriate*	*No Appropriate*
e310	Immediate family	Individuals related by birth, marriage or other relationship recognized by the culture as immediate family, such as spouses, partners, parents, siblings, children, foster parents, adoptive parents and grandparents.	**1.30**				
e315	Extended family	Individuals related through family or marriage or other relationships recognized by the culture as extended family, such as aunts, uncles, nephews and nieces.	**2.20**				
e320	Friends	Individuals who are close and ongoing participants in relationships characterized by trust and mutual support.	**1.90**				
e325	Acquaintances, peers, colleagues, neighbours and community members	Individuals who are familiar to each other as acquaintances, peers, colleagues, neighbours, and community members, in situations of work, school, recreation, or other aspects of life, and who share demographic features such as age, gender, religious creed or ethnicity or pursue common interests.	**2.90**				

Code	Category	Description	Relevant Degree	*Very Appropriate*	*Somewhat Appropriate*	*Slightly Appropriate*	*No Appropriate*
e340	Personal care providers and personal assistants	Individuals who provide services as required to support individuals in their daily activities and maintenance of performance at work, education or other life situation, provided either through public or private funds, or else on a voluntary basis, such as providers of support for home-making and maintenance, personal assistants, transport assistants, paid help, nannies and others who function as primary caregivers.	**2.00**				
e350	Domesticated animals	Animals that provide physical, emotional, or psychological support, such as pets (dogs, cats, birds, fish, etc.) and animals for personal mobility and transportation.	**2.60**				
e355	Health professionals	All service providers working within the context of the health system, such as doctors, nurses, physiotherapists, occupational therapists, speech therapists, audiologists, orthotist-prosthetists, medical social workers.	**1.70**				

4. Attitudes (Total Average of Code Items in Chapter "e4": 2.44)

Code	Category	Description	Relevant Degree	*Very Appropriate*	*Somewhat Appropriate*	*Slightly Appropriate*	*No Appropriate*
e410	Individual attitudes of immediate family members	General or specific opinions and beliefs of immediate family members about the person or about other matters (e.g. social, political and economic issues), that influence individual behaviour and actions.	**1.30**				
e415	Individual attitudes of extended family members	General or specific opinions and beliefs of extended family members about the person or about other matters (e.g. social, political and economic issues), that influence individual behaviour and actions.	**2.00**				
e420	Individual attitudes of friends	General or specific opinions and beliefs of friends about the person or about other matters (e.g. social, political and economic issues), that influence individual behaviour and actions.	**2.50**				
e425	Individual attitudes of acquaintances, peers, colleagues, neighbours and community members	General or specific opinions and beliefs of acquaintances, peers, colleagues, neighbours and community members about the person or about other matters (e.g. social, political and economic issues), that influence individual behaviour and actions.	**2.60**				

Code	Category	Description	Relevant Degree	*Very Appropriate*	*Somewhat Appropriate*	*Slightly Appropriate*	*No Appropriate*
e430	Individual attitudes of people in positions of authority	General or specific opinions and beliefs of people in positions of authority about the person or about other matters (e.g. social, political and economic issues), that influence individual behaviour and actions.	**2.90**				
e440	Individual attitudes of personal care providers and personal assistants	General or specific opinions and beliefs of personal care providers and personal assistants about the person or about other matters (e.g. social, political and economic issues), that influence individual behaviour and actions.	**1.80**				
e445	Individual attitudes of strangers	General or specific opinions and beliefs of strangers about the person or about other matters (e.g. social, political and economic issues), that influence individual behaviour and actions.	**2.90**				
e450	Individual attitudes of health professionals	General or specific opinions and beliefs of health professionals about the person or about other matters (e.g. social, political and economic issues), that influence individual behaviour and actions.	**1.80**				
e460	Societal attitudes	General or specific opinions and beliefs generally held by people of a culture, society, subcultural or other social group about other individuals or about other social, political and economic issues, that influence group or individual behavior and actions.	**2.50**				
e465	Social norms, practices and ideologies	Customs, practices, rules and abstract systems of values and normative beliefs (e.g. ideologies, normative world views and moral philosophies) that arise within social contexts and that affect or create societal and individual practices and behaviours, such as social norms of moral and religious behaviour or etiquette; religious doctrine and resulting norms and practices; norms governing rituals or social gatherings.	**2.70**				

5. Services, systems and policies (Total Average of Code Items in Chapter "e5": 2.69)

Code	Category	Description	Relevant Degree	*Very Appropriate*	*Somewhat Appropriate*	*Slightly Appropriate*	*No Appropriate*
e510	Services, systems and policies for the production of consumer goods	Services, systems and policies that govern and provide for the production of objects and products consumed or used by people.	**2.90**				
e515	Architecture and construction services, systems and policies	Services, systems and policies for the design and construction of buildings, public and private.	**2.20**				

Code	Category	Description	Relevant Degree	*Very Appropriate*	*Somewhat Appropriate*	*Slightly Appropriate*	*No Appropriate*
e520	Open space planning services, systems and policies	Services, systems and policies for the planning, design, development and maintenance of public lands, (e.g. parks, forests, shorelines, wetlands) and private lands in the rural, suburban and urban context.	**2.60**				
e540	Transportation services, systems and policies	Services, systems and policies for enabling people or goods to move or be moved from one location to another.	**1.80**				
e550	Legal services, systems and policies	Services, systems and policies concerning the legislation and other law of a country.	**2.30**				
e555	Associations and organizational services, systems and policies	Services, systems and policies relating to groups of people who have joined together in the pursuit of common, noncommercial interests, often with an associated membership structure.	**2.20**				
e560	Media services, systems and policies	Services, systems and policies for the provision of mass communication through radio, television, newspapers and internet.	**2.50**				
e570	Social security services, systems and policies	Services, systems and policies aimed at providing income support to people who, because of age, poverty, unemployment, health condition or disability, require public assistance that is funded either by general tax revenues or contributory schemes.	**2.00**				
e575	General social support services, systems and policies	Services, systems and policies aimed at providing support to those requiring assistance in areas such as shopping, housework, transport, child care, respite care, self-care and care of others, in order to function more fully in society.	**1.60**				
e580	Health services, systems and policies	Services, systems and policies for preventing and treating health problems, providing medical rehabilitation and promoting a healthy lifestyle.	**1.70**				
e585	Education and training services, systems and policies	Services, systems and policies for the acquisition, maintenance and improvement of knowledge, expertise and vocational or artistic skills. See UNESCO's International Standard Classification of Education (ISCED-1997).	**2.10**				

[Minority Comments on the Excluded Code Items]

The following items were excluded from the second-round questionnaire because they received a mean relevance value of 3.00 or more on the first questionnaire. In order to obtain optimal consensus, the Delphi method recommends respecting minority opinion and protecting against excessive influence of the majority when seeking consensus among experts. If you believe that any of the codes below are relevant and appropriate to assess the functioning of pupils aged 3–5 years with physical disabilities, please describe your opinion in the Statement of Opinion column below. These will be included again in the final-round questionnaire. If you have no opinion on an item, please leave the corresponding row in the Statement of Opinion column blank.

Ⅰ. Excluded Code Items in Activities & Participation

Code	Category	Relevant Degree	Statement of Opinion
1. Learning and applying knowledge			
d134	Acquiring additional language	**3.70**	
d140	Learning to read	**3.30**	
d145	Learning to write	**3.60**	
d150	Learning to calculate	**3.40**	
d163	Thinking	**3.40**	
d166	Reading	**3.50**	
d170	Writing	**3.30**	
d172	Calculating	**3.70**	
d175	Solving problems	**3.80**	
d177	Making decisions	**3.80**	
2. General tasks and demands			
d220	Undertaking multiple tasks	**3.90**	
d230	Carrying out daily routine	**3.50**	
d240	Handling stress and other psychological demands	**3.50**	
d250	Managing one's own behaviour	**3.00**	
3. Communication			
d320	Communicating with - receiving - formal sign language messages	**3.60**	
d325	Communicating with - receiving - written messages	**3.40**	
d340	Producing messages in formal sign language	**3.60**	
d345	Writing messages	**3.40**	
d355	Conversation	**3.80**	
4. Mobility			
d475	Driving	**3.70**	
d480	Riding animals for transportation	**3.40**	
5. Self-care			
d570	Looking after one's health	**3.60**	
d571	Looking after one's safety	**3.00**	
6. Domestic life			
d610	Acquiring a place to live	**3.90**	
d620	Acquisition of goods and services	**3.80**	

Code	Category	Relevant Degree	Statement of Opinion
d630	Preparing meals	**3.80**	
d640	Doing housework	**3.80**	
d650	Caring for household objects	**3.60**	
d660	Assisting others	**3.40**	
7. Interpersonal interactions and relationships			
d720	Complex interpersonal interactions	**3.00**	
d730	Relating with strangers	**3.30**	
d740	Formal relationships	**3.70**	
d760	Family relationships	**3.00**	
d770	Intimate relationships	**3.80**	
8. Major life areas			
d820	School education	**3.30**	
d825	Vocational training	**4.00**	
d830	Higher education	**4.00**	
d835	School life and related activities	**4.00**	
d840	Apprenticeship (work preparation)	**4.00**	
d845	Acquiring, keeping and terminating a job	**4.00**	
d850	Remunerative employment	**4.00**	
d855	Non-remunerative employment	**4.00**	
d860	Basic economic transactions	**3.30**	
d865	Complex economic transactions	**4.00**	
d870	Economic self-sufficiency	**4.00**	
9. Community, social and civic life			
d910	Community life	**3.70**	
d920	Recreation and leisure	**3.40**	
d930	Religion and spirituality	**3.50**	
d940	Human rights	**3.80**	
d950	Political life and citizenship	**3.80**	

Ⅱ. Excluded Code Items in Environmental Factors

Code	Category	Relevant Degree	Statement of Opinion
1. Products and technology			
e135	Assets	**3.30**	
e145	Products and technology for the practice of religion and spirituality	**3.50**	
e165	Products and technology for employment	**3.70**	
2. Natural environment and human-made changes to environment			
e210	Physical geography	**3.00**	
e215	Population	**3.20**	
e220	Flora and fauna	**3.10**	
e230	Natural events	**3.20**	
e235	Human-caused events	**3.10**	
e255	Vibration	**3.40**	
3. Support and relationships			

Code	Category	Relevant Degree	Statement of Opinion
e330	People in positions of authority	**3.40**	
e335	People in subordinate positions	**3.80**	
e345	Strangers	**3.10**	
e360	Other professionals	**3.00**	
4. Attitudes			
e435	Individual attitudes of other professionals	**3.00**	
e455	Individual attitudes of people in subordinate positions	**3.30**	
5. Services, systems and policies			
e525	Housing services	**3.30**	
e530	Utilities services	**3.40**	
e535	Communication services	**3.00**	
e545	Civil protection services	**3.60**	
e565	Economic services	**3.50**	
e590	Labour and employment services	**3.90**	
e595	Political services	**3.80**	

Thank you for your cooperation!

Appendix F: Third Round Questionnaire on Activities & Participation and Environmental Factors

Third Round Questionnaire of Activities & Participation and Environmental Factors

Number of Panel	
Target Age Group	**3–5 age group**

Expert Delphi Survey to Identify Classification Codes for Pupils with Physical Disabilities from the *International Classification of Functioning, Disability and Health, for Children and Youth* (ICF-CY)

Dear (Special Educators, Professors, or Parents),

This survey is being conducted for my master's study and as part of a research project of the Korean Solidarity for Human Rights of Disabled People with Brain Lesions (KSHB) (Researcher Sangwon Yoon, Master's Student at University of Oslo and Temporary Researcher of KSHB). The purpose of this research is to identify the most relevant classification items/codes of the International Classification of Functioning, Disability and Health, for Children and Youth (ICF-CY) to assess and support functioning of pupils with physical disabilities, including cerebral palsy (CP).

The ICF-CY, approved by the World Health Organization (WHO) in 2007, is the first universal classification system to document functioning and disability of children and youth from a perspective of individual and environmental factors. It not only offers a common language of functioning and disability in childhood and adolescence across disciplines and nations, but it also provides comprehensive information about both the individual and environmental factors that influence an individual child's functioning. That is, the ICF-CY overcomes the medical model in which disability is viewed only as the result of individual disease or deficit, and it also provides an internationally common classification system to record childhood health and functioning from a holistic bio-psycho-social perspective.

The aim of this survey is to request your professional or parental opinion about the most appropriate codes in the Activities & Participation and Environmental Factors domains of the ICF-CY for pupils with physical disabilities, including CP, in three age groups: 3–5, 6–12, and 13–18 years old. Your honest response to every item will be helpful to this study.

Please understand that although the ICF-CY is a universally applicable classification system for all countries, there may be awkward expressions and unfamiliar categories or codes as a result of translating the terms from Korean into English. All responses will be kept confidential by applicable law, and survey results will not be used for any purpose other than this research.

Thank you for your cooperation.

♠ If you have questions about the survey, please contact us below.
- Researcher: Sangwon Yoon (Master's Student at University of Oslo & Temporary Researcher of KSHB)
- Tel: XXX-XXX-XXXX
- E-mail: XXXXXX@XXXX.XXX

Department of Special Needs Education
University of Oslo

Korean Solidarity for Human Rights of
Disabled People with Brain Lesions

[Activities & Participation]

The following are the Activity & Participation domain categories or codes rated as most appropriate in the second-round questionnaire, together with additional items that were excluded but considered appropriate by those who expressed an opinion in the comments section on the second-round questionnaire.

The codes in each chapter below are arranged according to the second-round results in the order of their degree of appropriateness, with values ranging from 1.00 (very appropriate) to 2.99 (slightly appropriate) in order to help you judge the appropriateness of the code items for assessment of pupils with physical disabilities. This means that the item at the top of the table for each category has been rated the most appropriate code item, and the item at the bottom of the table for each category has been rated the least appropriate code item. Considering the degree of appropriateness for each item, please mark with a ✓ either ***Very Appropriate***, ***Somewhat Appropriate***, ***Slightly Appropriate***, or ***Not Appropriate*** in the columns below to indicate the ***appropriateness of an item to assess functioning of pupils aged 3–5 years with physical disabilities for special education services***. For instance, if you think the code item "d440 Fine hand use" is very necessary and appropriate to assess and support functioning of pupils aged 3 to 5 years with physical disabilities to facilitate their daily performance in special education services, you would check Very Appropriate; if you think the code item is somewhat appropriate, you would check Somewhat Appropriate; if you think the code item is slightly appropriate, you would check Slightly Appropriate; and if you think the code item is absolutely not appropriate, you would check Not Appropriate. In addition to ***physical disabilities***, you must consider the ***developmental characteristics of early childhood*** at 3–5 years when making your choice.

Furthermore, the codes that received minority comments are listed among the items in this last-round questionnaire. The minority comments are presented in the description column. Therefore, please review these minority comments and rate the extent of appropriateness for all "Additional Items" as well. (Please mark your choice with a ✓ in all categories or codes according to your professional or parental opinion about activities and participation of pupils with physical disabilities in the 3–5 age group.)

Results of the second-round survey are summarized as follows: The total average appropriateness value of all category codes in the Activities & Participation domain was 1.31. The second-round results showed that most of the "d8 Major life areas" items were considered very appropriate (average appropriateness value 1.23), followed by "d4 Mobility" (1.43), "d5 Self-care" (1.63), "d1 Learning and applying knowledge" (1.65), "d3 Communication" (1.84), and "d7 Interpersonal interactions and relationships" (2.00). As with the first and second questionnaires, code items with a mean value of 3 points or more were excluded from the third-round questionnaire.

1. Learning and applying knowledge (Total Average of Code Items in Chapter "d1": 1.65)

Code	Category	Description	Appropriate Degree	*Very Appropriate*	*Somewhat Appropriate*	*Slightly Appropriate*	*Not Appropriate*
d130	Copying	Imitating or mimicking as a basic component of learning, such as copying, repeating a facial expression, a gesture, a sound or the letters of an alphabet.	**1.30**				

Code	Category	Description	Appropriate Degree	*Very Appropriate*	*Somewhat Appropriate*	*Slightly Appropriate*	*Not Appropriate*
d131	Learning through actions with objects	Learning through simple actions on a single object, two or more objects, symbolic and pretend play, such as in hitting an object, banging blocks and playing with dolls or cars.	**1.40**				
d110	Watching	Using the sense of seeing intentionally to experience visual stimuli, such as visually tracking an object, watching persons, looking at a sporting event, person, or children playing.	**1.60**				
d120	Other purposeful sensing	Using the body's other basic senses intentionally to experience stimuli, such as touching and feeling textures, tasting sweets or smelling flowers.	**1.60**				
d133	Acquiring language	Developing the competence to represent persons, objects, events and feelings through words, symbols, phrases and sentences.	**1.60**				
d161	Directing attention	Intentionally maintaining attention to specific actions or tasks for an appropriate length of time.	**1.60**				
d132	Acquiring information	Obtaining facts about persons, things and events, such as asking why, what, where and how, asking for names.	**1.70**				
d160	Focusing attention	Intentionally focusing on specific stimuli, such as by filtering out distracting noises.	**1.70**				
d135	Rehearsing	Repeating a sequence of events or symbols as a basic component of learning, such as counting by tens or practising the recitation of a rhyme with gestures, counting by tens or practising the recitation of a poem.	**1.80**				
d155	Acquiring skills	Developing basic and complex competencies in integrated sets of actions or tasks so as to initiate and follow through with the acquisition of a skill, such as manipulating tools or toys, or playing games.	**1.80**				
d115	Listening	Using the sense of hearing intentionally to experience auditory stimuli, such as listening to a radio, the human voice, to music, a lecture, or to a story told.	**1.80**				
d137	Acquiring concepts	Developing competence to understand and use basic and complex concepts related to the characteristics of things, persons or events.	**1.90**				

Code	Category	Description	Appropriate Degree	*Very Appropriate*	*Somewhat Appropriate*	*Slightly Appropriate*	*Not Appropriate*
d140	Learning to read	Developing the competence to read written material (including Braille and other symbols) with fluency and accuracy, such as recognizing characters and alphabets, sounding out written words with correct pronunciation, and understanding words and phrases. **※ Minority Comment** ① The level of pre-reading skills for a preschool pupil with mild cerebral palsy must be known to improve their reading skills because they have a higher potential to improve cognitive development than do others with more severe disabilities. ② Reading skill is one of the four core components in early childhood language education, so it is necessary to assess and support learning to read.	**Additional Item**				
d145	Learning to write	Developing the competence to produce symbols that represent sounds, words or phrases in order to convey meaning (including Braille writing and other symbols), such as spelling effectively and using correct grammar. **※ Minority Comment** ① To improve their pre-writing skills, educators need to know the level of pre-writing skills for preschool pupils with mild cerebral palsy compared to those with severe cerebral palsy because they have a higher potential to improve cognitive development than do pupils with severe disabilities.	**Additional Item**				
d150	Learning to calculate	Developing the competence to manipulate numbers and perform simple and complex mathematical operations, such as using mathematical signs for addition and subtraction and applying the correct mathematical operation to a problem. **※ Minority Comment** ① I need to know the level of calculation skills for preschool pupils with mild cerebral palsy to improve their skills compared with pupils with severe cerebral palsy because they have a higher potential to improve cognitive development than do pupils with severe disabilities.	**Additional Item**				

2. General tasks and demands (Total Average of Code Items in Chapter "d2": 1.80)

Code	Category	Description	Appropriate Degree	*Very Appropriate*	*Somewhat Appropriate*	*Slightly Appropriate*	*Not Appropriate*
d210	Undertaking a single task	Carrying out simple or complex and coordinated actions related to the mental and physical components of a single task, such as initiating a task, organizing time, space and materials for a task, pacing task performance, and carrying out, completing and sustaining a task.	**1.80**				
d230	Carrying out daily routine	Carrying out simple or complex and coordinated actions in order to plan, manage and complete the requirements of day-to-day procedures or duties, such as budgeting time and making plans for separate activities throughout the day. **※ Minority Comment** ① Managing basic daily routines seems to be very relevant for preschool children with physical disabilities.	**Additional Item**				

3. Communication (Total Average of Code Items in Chapter "d3": 1.84)

Code	Category	Description	Appropriate Degree	*Very Appropriate*	*Somewhat Appropriate*	*Slightly Appropriate*	*Not Appropriate*
d331	Pre-talking	Vocalizing when aware of another person in the proximal environment, such as producing sounds when the mother is close; babbling; babbling in turn-taking activities. Vocalizing in response to speech through imitating speech-sounds in a turn taking procedure.	**1.20**				
d335	Producing nonverbal messages	Using gestures, symbols and drawings to convey messages, such as shaking one's head to indicate disagreement or drawing a picture or diagram to convey a fact or complex idea.	**1.50**				
d315	Communicating with - receiving - nonverbal messages	Comprehending the literal and implied meanings of messages conveyed by gestures, symbols and drawings, such as realizing that a child is tired when she rubs her eyes or that a warning bell means that there is a fire.	**1.60**				
d310	Communicating with - receiving - spoken messages	Comprehending literal and implied meanings of messages in spoken language, such as understanding that a statement asserts a fact or is an idiomatic expression, such as responding and comprehending spoken messages.	**1.90**				
d332	Singing	Producing tones in a sequence resulting in a melody or performing songs on one's own or in a group.	**1.90**				

Code	Category	Description	Appropriate Degree	*Very Appropriate*	*Somewhat Appropriate*	*Slightly Appropriate*	*Not Appropriate*
d330	Speaking	Producing words, phrases and longer passages in spoken messages with literal and implied meaning, such as expressing a fact or telling a story in oral language.	**2.00**				
d350	Conversation	Starting, sustaining and ending an interchange of thoughts and ideas, carried out by means of spoken, written, sign or other forms of language, with on	**2.30**				
d360	Using communication devices and techniques	Using devices, techniques and other means for the purposes of communicating, such as calling a friend on the telephone.	**2.30**				

4. Mobility (Total Average of Code Items in Chapter "d4": 1.43)

Code	Category	Description	Appropriate Degree	*Very Appropriate*	*Somewhat Appropriate*	*Slightly Appropriate*	*Not Appropriate*
d410	Changing basic body position	Getting into and out of a body position and moving from one location to another, such as rolling from one side to the other, sitting, standing, getting up out of a chair to lie down on a bed, and getting into and out of positions of kneeling or squatting.	**1.10**				
d435	Moving objects with lower extremities	Performing coordinated actions aimed at moving an object by using the legs and feet, such as kicking a ball or pushing pedals on a bicycle.	**1.10**				
d440	Fine hand use	Performing the coordinated actions of handling objects, picking up, manipulating and releasing them using one's hand, fingers and thumb, such as required to lift coins off a table or turn a dial or knob.	**1.10**				
d430	Lifting and carrying objects	Raising up an object or taking something from one place to another, such as when lifting a cup or toy, or carrying a box or a child from one room to another.	**1.20**				
d445	Hand and arm use	Performing the coordinated actions required to move objects or to manipulate them by using hands and arms, such as when turning door handles or throwing or catching an object.	**1.20**				
d450	Walking	Moving along a surface on foot, step by step, so that one foot is always on the ground, such as when strolling, sauntering, walking forwards, backwards, or sideways.	**1.20**				

Code	Category	Description	Appropriate Degree	*Very Appropriate*	*Somewhat Appropriate*	*Slightly Appropriate*	*Not Appropriate*
d415	Maintaining a body position	Staying in the same body position as required, such as remaining seated or remaining standing for work or school.	**1.30**				
d420	Transferring oneself	Moving from one surface to another, such as sliding along a bench or moving from a bed to a chair, without changing body position.	**1.40**				
d455	Moving around	Moving the whole body from one place to another by means other than walking, such as climbing over a rock or running down a street, skipping, scampering, jumping, somersaulting or running around obstacles.	**1.40**				
d460	Moving around in different locations	Walking and moving around in various places and situations, such as walking between rooms in a house, within a building, or down the street of a town.	**1.50**				
d465	Moving around using equipment	Moving the whole body from place to place, on any surface or space, by using specific devices designed to facilitate moving or create other ways of moving around, such as with skates, skis, scuba equipment, swim fins, or moving down the street in a wheelchair or a walker.	**1.60**				
d446	Fine foot use	Performing the coordinated actions to move or manipulate objects using one's foot and toes.	**2.00**				
d470	Using transportation	Using transportation to move around as a passenger, such as being driven in a car, bus, rickshaw, jitney, pram or stroller, animal-powered vehicle, private or public taxi, train, tram, subway, boat or aircraft.	**2.50**				

5. Self-care (Total Average of Code Items in Chapter "d5": 1.63)

Code	Category	Description	Appropriate Degree	*Very Appropriate*	*Somewhat Appropriate*	*Slightly Appropriate*	*Not Appropriate*
d550	Fine hand use	Performing the coordinated actions of handling objects, picking up, manipulating and releasing them using one's hand, fingers and thumb, such as required to lift coins off a table or turn a dial or knob.	**1.20**				
d530	Transferring oneself	Moving from one surface to another, such as sliding along a bench or moving from a bed to a chair, without changing body position.	**1.30**				
d560	Eating	Indicating need for, and carrying out the coordinated tasks and actions of eating food that has been served, bringing it to the mouth and consuming it in culturally acceptable ways, cutting or breaking food into pieces, opening bottles and cans, using eating implements, having meals, feasting or dining.	**1.30**				

Code	Category	Description	Appropriate Degree	*Very Appropriate*	*Somewhat Appropriate*	*Slightly Appropriate*	*Not Appropriate*
d510	Toileting	Indicating the need for, planning and carrying out the elimination of human waste (menstruation, urination and defecation), and cleaning oneself afterwards.	**1.80**				
d540	Dressing	Carrying out the coordinated actions and tasks of putting on and taking off clothes and footwear in sequence and in keeping with climatic and social conditions, such as by putting on, adjusting and removing shirts, skirts, blouses, pants, undergarments, saris, kimono, tights, hats, gloves, coats, shoes, boots, sandals and slippers.	**2.00**				
d520	Caring for body parts	Looking after those parts of the body, such as skin, face, teeth, scalp, nails and genitals, that require more than washing and drying.	**2.20**				

6. Domestic life (All codes were excluded)

7. Interpersonal interactions and relationships (Total Average of Code Items in Chapter "d7": 2.00)

Code	Category	Description	Appropriate Degree	*Very Appropriate*	*Somewhat Appropriate*	*Slightly Appropriate*	*Not Appropriate*
d710	Basic interpersonal interactions	Interacting with people in a contextually and socially appropriate manner, such as by showing consideration and esteem when appropriate, or responding to the feelings of others.	**1,70**				
d750	Informal social relationships	Entering into relationships with others, such as casual relationships with people living in the same community or residence, or with co-workers, pupils, playmates or people with similar backgrounds or professions.	**2.30**				
d760	Family relationships	Creating and maintaining kinship relationships, such as with members of the nuclear family, extended family, foster and adopted family and step-relationships, more distant relationships such as second cousins, or legal guardians. **※ Minority Comment** ① 3–5-year-old children with physical disabilities have to get a lot of help from their families compared with others without disabilities. ② Family relationships are totally important in early childhood development for pupils with or without disabilities.	**Additional Item**				

8. Major life areas (Total Average of Code Items in Chapter "d8": 3.25)

Code	Category	Description	Appropriate Degree	*Very Appropriate*	*Somewhat Appropriate*	*Slightly Appropriate*	*Not Appropriate*
d880	Engagement in play	Purposeful, sustained engagement in activities with objects, toys, materials or games, occupying oneself or with others.	**1.00**				
d815	Preschool education	Learning at an initial level of organized instruction in the home or in the community designed primarily to introduce a child to a school-type environment and prepare the child for compulsory education, such as by acquiring skills in a day-care or similar setting in preparation for school (e.g. educational services provided in the home or in community settings designed to promote health and cognitive, motor, language and social development and readiness skills for formal education).	**1.10**				
d816	Preschool life and related activities	Engaging in preschool life and related activities, such as excursions and celebrations.	**1.20**				
d810	Informal education	Learning at home or in some other non-institutional setting, such as acquiring non-academic (e.g. crafts) or academic (e.g. home-schooling) skills from parents or family member in home or community.	**1.60**				

9. Community, social and civic life (All codes were excluded in the second round questionnaire)

Code	Category	Description	Appropriate Degree	*Very Appropriate*	*Somewhat Appropriate*	*Slightly Appropriate*	*Not Appropriate*
d920	Recreation and leisure	Engaging in any form of play, recreational or leisure activity, such as informal or organized play and sports, programmes of physical fitness, relaxation, amusement or diversion, going to art galleries, museums, cinemas or theatres; engaging in crafts or hobbies, reading for enjoyment, playing musical instruments; sightseeing, tourism and travelling for pleasure. **※ Minority Comment** ① With regard to playing, recreation and leisure are very important learning activities in childhood development.	**Additional Item**				
d940	Human rights	Enjoying all nationally and internationally recognized rights that are accorded to people by virtue of their humanity alone, such as human rights as recognized by the United Nations Universal Declaration of Human Rights (1948) and the United **※ Minority Comment** ① Human rights are very significant for all people. The educational rights of pupils with physical disabilities especially tend to be ignored even if early intervention is most crucial to protect against secondary developmental delay.	**Additional Item**				

[Environmental Factors]

The following are the Environmental Factors domain categories or codes rated as most appropriate in the second-round questionnaire, together with additional items that were excluded but considered appropriate by those who expressed an opinion in the comments section on the second-round questionnaire.
The codes in each chapter below are arranged according to the second-round results in the order of their degree of appropriateness, with values ranging from 1.00 (very appropriate) to 2.99 (slightly appropriate) in order to help you judge the appropriateness of the code items for assessment of pupils with physical disabilities. This means that the item at the top of the table for each category has been rated as the most appropriate code item, and the item at the bottom of the table for each category has been rated as the least appropriate code item.
Considering the degree of appropriateness for each item, please mark with a ✓ either ***Very Appropriate***, ***Somewhat Appropriate***, ***Slightly Appropriate***, or ***Not Appropriate*** in the columns below to indicate the ***appropriateness of an item to assess functioning of pupils aged 3–5 years with physical disabilities for special education services***. For instance, if you think the environmental factor "e120 Products and technology that constitute an individual's indoor and outdoor human-made environment that is planned, designed and constructed for public use, including those adapted or specially designed" is very appropriate and necessary to assess and support functioning of pupils with physical disabilities aged 3 to 5 years to facilitate their daily performance in special education services, you would check *Very Appropriate*; if you think the item is somewhat appropriate, you would check *Somewhat Appropriate*; if you think the item is slightly appropriate, you would check *Slightly Appropriate*; and if you think the item is absolutely not appropriate, you would check *Not Appropriate*. In addition to ***physical disabilities***, you must consider the ***developmental characteristics of early childhood*** at 3–5 years when making your choice.
Furthermore, the codes that received minority comments are listed among the items in this last-round questionnaire. The minority comments are presented in the description column. Please review these minority comments and rate the extent of appropriateness for all "Additional Items" as well. (Please mark your choice in all categories or codes according to your professional or parental opinion about environmental factors influencing the performance of pupils with physical disabilities in the 3–5 age group.)
Results of the second-round survey are summarized as follows: The total average appropriateness of all category codes in the Environmental-Factors domain was 1.89. The "e1 Products and technology" received an average appropriateness rating of 1.51 (very appropriate), followed by "e3 Support and relationships" (1.64), "e5 Services, systems, and policies" (1.92), "e4 Attitudes" (2.12), and "e2 Natural environment and human-made changes to environment" (2.40). As with the first and second questionnaires, items with a mean value of 3 points or more were excluded from the third-round questionnaire.

1. Products and technology (Total Average of Code Items in Chapter "e1": 1.51)

Code	Category	Description	Appropriate Degree	*Very Appropriate*	*Somewhat Appropriate*	*Slightly Appropriate*	*Not Appropriate*
e120	Products and technology for personal indoor and outdoor mobility and transportation	Equipment, products and technologies used by people in activities of moving inside and outside buildings, including those adapted or specially designed, located in, on or near the person using them.	**1.10**				

Code	Category	Description	Appropriate Degree	*Very Appropriate*	*Somewhat Appropriate*	*Slightly Appropriate*	*Not Appropriate*
e115	Products and technology for personal use in daily living	Equipment, products and technologies used by people in daily activities, including those adapted or specially designed, located in, on or near the person using them.	**1.20**				
e125	Products and technology for communication	Equipment, products and technologies used by people in activities of sending and receiving information, including those adapted or specially designed, located in, on or near the person using them.	**1.30**				
e130	Products and technology for education	Equipment, products, processes, methods and technology used for acquisition of knowledge, expertise or skill, including those adapted or specially designed.	**1.40**				
e150	Design, construction and building products and technology of buildings for public use	Products and technology that constitute an individual's indoor and outdoor human-made environment that is planned, designed and constructed for public use, including those adapted or specially designed.	**1.40**				
e155	Design, construction and building products and technology of buildings for private use	Products and technology that constitute an individual's indoor and outdoor human-made environment that is planned, designed and constructed for private use (e.g. home, dwelling), including those adapted or specially designed.	**1.40**				
e140	Products and technology for culture, recreation and sport	Equipment, products and technology used for the conduct and enhancement of cultural, recreational and sporting activities, including those adapted or specially designed.	**1.70**				
e110	Products or substances for personal consumption	Any natural or human-made object or substance gathered, processed or manufactured for ingestion.	**1.80**				
e160	Products and technology of land development	Products and technology of land areas, as they affect an individual's outdoor environment through the implementation of land use policies, design, planning and development of space, including those adapted or specially designed.	**2.30**				

2. Natural environment and human-made changes to environment (Total Average of Code Items in Chapter "e2": 2.40)

Code	Category	Description	Appropriate Degree	*Very Appropriate*	*Somewhat Appropriate*	*Slightly Appropriate*	*Not Appropriate*
e240	Light	Electromagnetic radiation by which things are made visible by either sunlight or artificial lighting (e.g. candles, oil or paraffin lamps, fires and electricity), and which may provide useful or distracting information about the world.	**2.30**				
e250	Sound	A phenomenon that is or may be heard, such as banging, ringing, thumping, singing, whistling, yelling or buzzing, in any volume, timbre or tone, and that may provide useful or distracting information about the world.	**2.30**				
e260	Air quality	Characteristics of the atmosphere (outside buildings) or enclosed areas of air (inside buildings), and which may provide useful or distracting information about the world.	**2.30**				
e245	Time-related changes	Natural, regular or predictable temporal change.	**2.50**				
e225	Climate	Meteorological features and events, such as the weather.	**2.60**				

3. Support and relationships (Total Average of Code Items in Chapter "e3": 1.64)

Code	Category	Description	Appropriate Degree	*Very Appropriate*	*Somewhat Appropriate*	*Slightly Appropriate*	*Not Appropriate*
e355	Health professionals	All service providers working within the context of the health system, such as doctors, nurses, physiotherapists, occupational therapists, speech therapists, audiologists, orthotist-prosthetists, medical social workers.	**1.00**				
e310	Immediate family	Individuals related by birth, marriage or other relationship recognized by the culture as immediate family, such as spouses, partners, parents, siblings, children, foster parents, adoptive parents and grandparents.	**1.10**				
e320	Friends	Individuals who are close and ongoing participants in relationships characterized by trust and mutual support.	**1.40**				
e340	Personal care providers and personal assistants	Individuals who provide services as required to support individuals in their daily activities and maintenance of performance at work, education or other life situation, provided either through public or private funds, or else on a voluntary basis, such as providers of support for home-making and maintenance, personal assistants, transport assistants, paid help, nannies and others who function as primary caregivers.	**1.70**				

Code	Category	Description	Appropriate Degree	*Very Appropriate*	*Somewhat Appropriate*	*Slightly Appropriate*	*Not Appropriate*
e315	Extended family	Individuals related through family or marriage or other relationships recognized by the culture as extended family, such as aunts, uncles, nephews and nieces.	**1.90**				
e350	Domesticated animals	Animals that provide physical, emotional, or psychological support, such as pets (dogs, cats, birds, fish, etc.) and animals for personal mobility and transportation.	**2.20**				
e325	Acquaintances, peers, colleagues, neighbours and community members	Individuals who are familiar to each other as acquaintances, peers, colleagues, neighbours, and community members, in situations of work, school, recreation, or other aspects of life, and who share demographic features such as age, gender, religious creed or ethnicity or pursue common interests.	**2.20**				

4. Attitudes (Total Average of Code Items in Chapter "e4": 2.12)

Code	Category	Description	Appropriate Degree	*Very Appropriate*	*Somewhat Appropriate*	*Slightly Appropriate*	*Not Appropriate*
e410	Individual attitudes of immediate family members	General or specific opinions and beliefs of immediate family members about the person or about other matters (e.g. social, political and economic issues), that influence individual behaviour and actions.	**1.00**				
e440	Individual attitudes of personal care providers and personal assistants	General or specific opinions and beliefs of personal care providers and personal assistants about the person or about other matters (e.g. social, political and economic issues), that influence individual behaviour and actions.	**1.50**				
e450	Individual attitudes of health professionals	General or specific opinions and beliefs of health professionals about the person or about other matters (e.g. social, political and economic issues), that influence individual behaviour and actions.	**1.60**				
e415	Individual attitudes of extended family members	General or specific opinions and beliefs of extended family members about the person or about other matters (e.g. social, political and economic issues), that influence individual behaviour and actions.	**1.70**				
e420	Individual attitudes of friends	General or specific opinions and beliefs of friends about the person or about other matters (e.g. social, political and economic issues), that influence individual behaviour and actions.	**2.00**				

Code	Category	Description	Appropriate Degree	*Very Appropriate*	*Somewhat Appropriate*	*Slightly Appropriate*	*Not Appropriate*
e425	Individual attitudes of acquaintances, peers, colleagues, neighbours and community members	General or specific opinions and beliefs of acquaintances, peers, colleagues, neighbours and community members about the person or about other matters (e.g. social, political and economic issues), that influence individual behaviour and actions.	**2.10**				
e460	Societal attitudes	General or specific opinions and beliefs generally held by people of a culture, society, subcultural or other social group about other individuals or about other social, political and economic issues, that influence group or individual behavior and actions.	**2.30**				
e465	Social norms, practices and ideologies	Customs, practices, rules and abstract systems of values and normative beliefs (e.g. ideologies, normative world views and moral philosophies) that arise within social contexts and that affect or create societal and individual practices and behaviours, such as social norms of moral and religious behaviour or etiquette; religious doctrine and resulting norms and practices; norms governing rituals or social gatherings.	**2.70**				
e445	Individual attitudes of strangers	General or specific opinions and beliefs of strangers about the person or about other matters (e.g. social, political and economic issues), that influence individual behaviour and actions.	**2.80**				

5. Services, systems and policies (Total Average of Code Items in Chapter "e5": 1.92)

Code	Category	Description	Appropriate Degree	*Very Appropriate*	*Somewhat Appropriate*	*Slightly Appropriate*	*Not Appropriate*
e580	Health services, systems and policies	Services, systems and policies for preventing and treating health problems, providing medical rehabilitation and promoting a healthy lifestyle.	**1.00**				
e575	General social support services, systems and policies	Services, systems and policies aimed at providing support to those requiring assistance in areas such as shopping, housework, transport, child care, respite care, self-care and care of others, in order to function more fully in society.	**1.20**				
e570	Social security services, systems and policies	Services, systems and policies aimed at providing income support to people who, because of age, poverty, unemployment, health condition or disability, require public assistance that is funded either by general tax revenues or contributory schemes.	**1.50**				

Code	Category	Description	Appropriate Degree	*Very Appropriate*	*Somewhat Appropriate*	*Slightly Appropriate*	*Not Appropriate*
e540	Transportation services, systems and policies	Services, systems and policies for enabling people or goods to move or be moved from one location to another.	**1.60**				
e550	Legal services, systems and policies	Services, systems and policies concerning the legislation and other law of a country.	**1.70**				
e585	Education and training services, systems and policies	Services, systems and policies for the acquisition, maintenance and improvement of knowledge, expertise and vocational or artistic skills. See UNESCO's International Standard Classification of Education (ISCED-1997).	**1.90**				
e515	Architecture and construction services, systems and policies	Services, systems and policies for the design and construction of buildings, public and private.	**2.10**				
e555	Associations and organizational services, systems and policies	Services, systems and policies relating to groups of people who have joined together in the pursuit of common, noncommercial interests, often with an associated membership structure.	**2.30**				
e560	Media services, systems and policies	Services, systems and policies for the provision of mass communication through radio, television, newspapers and internet.	**2.50**				
e510	Services, systems and policies for the production of consumer goods	Services, systems and policies that govern and provide for the production of objects and products consumed or used by people.	**2.60**				
e520	Open space planning services, systems and policies	Services, systems and policies for the planning, design, development and maintenance of public lands, (e.g. parks, forests, shorelines, wetlands) and private lands in the rural, suburban and urban context.	**2.70**				

Thank you for your cooperation!

Appendix G: Permission Letter

Norsk samfunnsvitenskapelig datatjeneste AS
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Peer Møller Sørensen
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Universitetet i Oslo
Postboks 1140 Blindern
0318 OSLO

Vår dato: 24.07.2012 Vår ref:30896 / 3 / MAS Deres dato: Deres ref:

TILBAKEMELDING PÅ MELDING OM BEHANDLING AV PERSONOPPLYSNINGER

Vi viser til melding om behandling av personopplysninger, mottatt 20.06.2012. All nødvendig informasjon om prosjektet forelå i sin helhet 23.07.2012. Meldingen gjelder prosjektet:

30896	*Developing Core Sets for Students with Physical Disabilities based on International Classification of Functioning Disability and Health, for Children and Youth (ICF-CY)*
Behandlingsansvarlig	*Universitetet i Oslo, ved institusjonens øverste leder*
Daglig ansvarlig	*Peer Møller Sørensen*
Student	*Sangwon Yoon*

Personvernombudet har vurdert prosjektet og finner at behandlingen av personopplysninger er meldepliktig i henhold til personopplysningsloven § 31. Behandlingen tilfredsstiller kravene i personopplysningsloven.

Personvernombudets vurdering forutsetter at prosjektet gjennomføres i tråd med opplysningene gitt i meldeskjemaet, korrespondanse med ombudet, eventuelle kommentarer samt personopplysningsloven og helseregisterloven med forskrifter. Behandlingen av personopplysninger kan settes i gang.

Det gjøres oppmerksom på at det skal gis ny melding dersom behandlingen endres i forhold til de opplysninger som ligger til grunn for personvernombudets vurdering. Endringsmeldinger gis via et eget skjema, http://www.nsd.uib.no/personvern/forsk_stud/skjema.html. Det skal også gis melding etter tre år dersom prosjektet fortsatt pågår. Meldinger skal skje skriftlig til ombudet.

Personvernombudet har lagt ut opplysninger om prosjektet i en offentlig database, http://www.nsd.uib.no/personvern/prosjektoversikt.jsp.

Personvernombudet vil ved prosjektets avslutning, 30.06.2013, rette en henvendelse angående status for behandlingen av personopplysninger.

Vennlig hilsen

Bjørn Henrichsen

Mads Solberg

Mads Solberg tlf: 55 58 89 28
Vedlegg: Prosjektvurdering
Kopi: Sangwon Yoon, 101-708, Kumho Apt., Yeongju-dong, Jung-gu
Busan, South Korea, -1 UKJENT

Personvernombudet for forskning

Prosjektvurdering - Kommentar

Prosjektnr: 30896

The study examines which codes in the ICF-CY two-level classification are relevant to educational needs of students with physical disabilities in South Korea.

The sample consist of about 40 individuals equally distributed between:
- Doctors of rehabilitation or pediatrics
- Parents with children with disabilities
- Special education teacher
- Adults with physical disabilities

Recruitment is done via various relevant social and professional organizations and initial contact established through administrators of these networks.

The Data Protection Official for Research finds the consent letter of 23.07.2012 satisfactory.

When the project is finished in 30.06.2013, all data will be anonymised. In order for the data to be fully anonymised, all direct identifying data and audio recordings must be deleted, and indirectly identifiable information in the remaining data must be deleted or changed.

Appendix H: Results of Delphi Survey in Body Functions

Chapter 1 Mental functions

Code	Category	3–5 yrs (N=5)	6–12 yrs (N=5)	13–18 yrs (N=5)
b110	Consciousness functions	1.60	1.60	1.60
b114	Orientation functions	1.40	1.40	1.20
b117	Intellectual functions	1.60	1.20	1.20
b122	Global psychosocial functions	2.00	1.60	1.40
b125	Dispositions and intra-personal functions	2.80	1.80	1.80
b126	Temperament and personality functions	2.20	1.60	1.60
b130	Energy and drive functions	2.20	1.60	1.40
b134	Sleep functions	2.40	2.00	1.60
b140	Attention functions	1.20	1.00	1.20
b144	Memory functions	1.40	1.00	1.20
b147	Psychomotor functions	1.80	1.20	1.20
b152	Emotional functions	1.40	1.40	1.20
b156	Perceptual functions	1.40	1.40	1.20
b160	Thought functions	1.80	1.20	1.20
b163	Basic cognitive functions	1.20	1.00	1.20
b164	Higher-level cognitive functions	2.40	1.60	1.60
b167	Mental functions of language	1.40	1.20	1.40
b172	Calculation functions	2.20	1.60	1.60
b176	Mental function of sequencing complex movements	1.80	1.40	1.60
b180	Experience of self and time functions	2.20	1.40	1.20

Chapter 2 Sensory functions and pain

Code	Category	3–5 yrs (N=5)	6–12 yrs (N=5)	13–18 yrs (N=5)
b210	Seeing functions	1.20	1.20	1.20
b215	Functions of structures adjoining the eye	2.00	2.00	2.00
b220	Sensations associated with the eye and adjoining structures	2.40	2.60	2.20
b230	Hearing functions	1.40	1.40	2.40
b235	Vestibular functions	1.40	2.00	1.40
b240	Sensations associated with hearing and vestibular function	2.20	2.60	1.60
b250	Taste function	3.00	2.80	2.60
b255	Smell function	3.20	2.80	2.80
b260	Proprioceptive function	1.40	1.20	1.80
b265	Touch function	2.20	2.00	1.80
b270	Sensory functions related to temperature and other stimuli	1.80	1.80	1.20
b280	Sensation of pain	2.00	1.80	1.40

Chapter 3 Voice and speech functions

Code	Category	3–5 yrs (N=5)	6–12 yrs (N=5)	13–18 yrs (N=5)
b310	Voice functions	1.60	1.20	1.40
b320	Articulation functions	1.60	1.20	1.40
b330	Fluency and rhythm of speech functions	1.80	1.20	1.40
b340	Alternative vocalization functions	2.60	2.00	1.80

Chapter 4 Functions of the cardiovascular, haematological, immunological and respiratory systems

Code	Category	3–5 yrs (N=5)	6–12 yrs (N=5)	13–18 yrs (N=5)
b410	Heart functions	1.60	1.40	1.60
b415	Blood vessel functions	2.00	2.20	2.00
b420	Blood pressure functions	2.20	2.20	2.00
b430	Haematological system functions	2.20	2.00	2.00
b435	Immunological system functions	2.20	2.20	2.00
b440	Respiration functions	1.40	1.60	1.40
b445	Respiratory muscle functions	1.40	1.20	1.60
b450	Additional respiratory functions	2.20	2.20	2.00
b455	Exercise tolerance functions	2.00	1.40	1.40
b460	Sensations associated with cardiovascular and respiratory functions	2.00	1.60	1.60

Chapter 5 Functions of the digestive, metabolic and endocrine systems

Code	Category	3–5 yrs (N=5)	6–12 yrs (N=5)	13–18 yrs (N=5)
b510	Ingestion functions	1.40	1.40	1.40
b515	Digestive functions	1.60	1.80	1.80
b520	Assimilation functions	2.20	2.40	1.80
b525	Defecation functions	1.60	1.40	1.60
b530	Weight maintenance functions	1.40	1.60	1.40
b535	Sensations associated with the digestive system	2.20	2.20	1.80
b540	General metabolic functions	2.20	2.20	1.80
b545	Water, mineral and electrolyte balance functions	2.00	2.40	2.00
b550	Thermoregulatory functions	2.40	2.40	1.80
b555	Endocrine gland functions	2.60	2.80	2.20
b560	Growth maintenance functions	1.80	1.20	1.40

Chapter 6 Genitourinary and reproductive functions

Code	Category	3–5 yrs (N=5)	6–12 yrs (N=5)	13–18 yrs (N=5)
b610	Urinary excretory functions	2.20	2.00	2.00
b620	Urination functions	1.40	1.40	1.40
b630	Sensations associated with urinary functions	1.60	1.60	1.60
b640	Sexual functions	4.00	3.40	2.40
b650	Menstruation functions	4.00	3.20	2.00
b660	Procreation functions	4.00	3.40	2.40
b670	Sensations associated with genital and reproductive functions	4.00	3.40	2.20

Chapter 7 Neuromusculoskeletal and movement-related functions

Code	Category	3–5 yrs (N=5)	6–12 yrs (N=5)	13–18 yrs (N=5)
b710	Mobility of joint functions	1.00	1.00	1.00
b715	Stability of joint functions	1.20	1.00	1.00
b720	Mobility of bone functions	1.20	1.00	1.00
b730	Muscle power functions	1.00	1.00	1.00
b735	Muscle tone functions	1.20	1.00	1.00
b740	Muscle endurance functions	1.00	1.00	1.00
b750	Motor reflex functions	1.20	1.40	1.40
b755	Involuntary movement reaction functions	1.60	1.40	1.40
b760	Control of voluntary movement functions	1.20	1.00	1.00
b761	Spontaneous movements	1.20	1.20	1.20
b765	Involuntary movement functions	1.80	1.40	1.40
b770	Gait pattern functions	1.40	1.20	1.20
b780	Sensations related to muscles and movement functions	1.40	1.40	1.40

Chapter 8 Functions of the skin and related structures

Code	Category	3–5 yrs (N=5)	6–12 yrs (N=5)	13–18 yrs (N=5)
b810	Protective functions of the skin	2.60	2.80	2.20
b820	Repair functions of the skin	3.00	3.00	2.60
b830	Other functions of the skin	3.00	3.00	3.00
b840	Sensation related to the skin	2.60	3.00	2.80
b850	Functions of hair	3.40	3.40	3.20
b860	Functions of nails	3.40	3.40	3.20

Appendix I: Results of Delphi Survey in Body Structures

Chapter 1 Structures of the nervous system

Code	Category	3–5 yrs (N=5)	6–12 yrs (N=5)	13–18 yrs (N=5)
s110	Structure of brain	1.00	1.20	1.00
s120	Spinal cord and related structures	1.00	1.20	1.00
s130	Structure of meninges	1.60	2.60	2.60
s140	Structure of sympathetic nervous system	2.40	2.40	2.40
s150	Structure of parasympathetic nervous system	2.40	2.40	2.40

Chapter 2 The eye, ear and related structures

Code	Category	3–5 yrs (N=5)	6–12 yrs (N=5)	13–18 yrs (N=5)
s210	Structure of eye socket	2.80	2.20	2.60
s220	Structure of eyeball	2.40	2.20	2.20
s230	Structures around eye	3.00	2.80	2.80
s240	Structure of external ear	3.00	2.80	2.80
s250	Structure of middle ear	2.40	2.60	2.60
s260	Structure of inner ear	2.00	2.20	2.00

Chapter 3 Structures involved in voice and speech

Code	Category	3–5 yrs (N=5)	6–12 yrs (N=5)	13–18 yrs (N=5)
s310	Structure of nose	2.20	2.20	2.20
s320	Structure of mouth	1.40	1.60	1.80
s330	Structure of pharynx	2.00	2.00	2.00
s340	Structure of larynx	1.80	2.00	2.00

Chapter 4 Structures of the cardiovascular, immunological and respiratory systems

Code	Category	3–5 yrs (N=5)	6–12 yrs (N=5)	13–18 yrs (N=5)
s410	Structure of cardiovascular system	1.60	1.80	1.60
s420	Structure of immune system	2.80	2.40	1.80
s430	Structure of respiratory system	1.40	1.80	1.60

Chapter 5 Structures related to the digestive, metabolic and endocrine systems

Code	Category	3–5 yrs (N=5)	6–12 yrs (N=5)	13–18 yrs (N=5)
s510	Structure of salivary glands	3.00	3.00	3.00
s520	Structure of oesophagus	2.80	3.00	2.60
s530	Structure of stomach	3.00	3.00	2.60
s540	Structure of intestine	3.00	3.00	3.00
s550	Structure of pancreas	3.40	3.00	3.00
s560	Structure of liver	3.40	3.00	3.00
s570	Structure of gall bladder and ducts	3.40	3.00	3.00
s580	Structure of endocrine glands	3.00	3.00	2.80

Chapter 6 Structures related to the genitourinary and reproductive systems

Code	Category	3–5 yrs (N=5)	6–12 yrs (N=5)	13–18 yrs (N=5)
s610	Structure of urinary system	2.20	2.00	1.80
s620	Structure of pelvic floor	2.60	2.80	2.20
s630	Structure of reproductive system	3.00	2.60	2.40

Chapter 7 Structures related to movement

Code	Category	3–5 yrs (N=5)	6–12 yrs (N=5)	13–18 yrs (N=5)
s710	Structure of head and neck region	1.80	1.40	1.60
s720	Structure of shoulder region	1.40	1.20	1.20
s730	Structure of upper extremity	1.00	1.00	1.00
s740	Structure of pelvic region	1.20	1.00	1.40
s750	Structure of lower extremity	1.00	1.00	1.00
s760	Structure of trunk	2.00	1.80	1.80
s770	Additional musculoskeletal structures related to movement	1.40	1.20	1.20

Chapter 8 Skin and related structures

Code	Category	3–5 yrs (N=5)	6–12 yrs (N=5)	13–18 yrs (N=5)
s810	Structure of areas of skin	3.00	3.20	3.00
s820	Structure of skin glands	3.40	3.40	3.20
s830	Structure of nails	3.40	3.40	3.40
s840	Structure of hair	3.40	3.40	3.20

Appendix J: Results of First Delphi Survey in Activities & Participation

Chapter 1 Learning and applying knowledge

Code	Category	3–5 yrs (N=10)	6–12 yrs (N=10)	13–18 yrs (N=10)
d110	Watching	2.10	2.30	2.60
d115	Listening	2.60	2.40	3.10
d120	Other purposeful sensing	2.50	2.10	2.60
d130	Copying	1.60	1.70	2.30
d131	Learning through actions with objects	1.40	1.30	2.20
d132	Acquiring information	2.10	2.20	2.20
d133	Acquiring language	2.10	1.80	2.50
d134	Acquiring additional language	3.70	3.10	3.10
d135	Rehearsing	2.30	2.30	2.80
d137	Acquiring concepts	2.40	2.40	2.50
d140	Learning to read	3.30	2.10	2.70
d145	Learning to write	3.60	1.50	2.10
d150	Learning to calculate	3.40	1.90	2.70
d155	Acquiring skills	2.70	1.20	1.80
d160	Focusing attention	2.40	2.00	2.70
d161	Directing attention	2.30	2.00	2.70
d163	Thinking	3.40	2.90	2.40
d166	Reading	3.50	2.20	2.70
d170	Writing	3.30	1.80	1.70
d172	Calculating	3.70	2.00	2.40
d175	Solving problems	3.80	2.50	2.60
d177	Making decisions	3.80	2.50	2.50

Chapter 2 General tasks and demands

Code	Category	3–5 yrs (N=10)	6–12 yrs (N=10)	13–18 yrs (N=10)
d210	Undertaking a single task	2.20	1.80	1.60
d220	Undertaking multiple tasks	3.90	2.20	2.10
d230	Carrying out daily routine	3.50	2.10	2.10
d240	Handling stress and other psychological demands	3.50	2.40	2.50
d250	Managing one's own behaviour	3.00	2.30	2.40

Chapter 3 Communication

Code	Category	3–5 yrs (N=10)	6–12 yrs (N=10)	13–18 yrs (N=10)
d310	Communicating with - receiving - spoken messages	2.10	2.30	2.40
d315	Communicating with - receiving - nonverbal messages	1.90	2.10	2.80
d320	Communicating with - receiving - formal sign language messages	3.60	3.70	3.30
d325	Communicating with - receiving - written messages	3.40	2.50	2.40
d330	Speaking	2.00	2.10	2.10
d331	Pre-talking	2.20	2.50	2.70
d332	Singing	2.40	2.40	2.30
d335	Producing nonverbal messages	1.70	2.10	2.20
d340	Producing messages in formal sign language	3.60	3.50	3.00
d345	Writing messages	3.40	2.10	1.90
d350	Conversation	2.70	2.40	1.90
d355	Discussion	3.80	2.80	2.00
d360	Using communication devices and techniques	2.90	2.00	1.90

Chapter 4 Mobility

Code	Category	3–5 yrs (N=10)	6–12 yrs (N=10)	13–18 yrs (N=10)
d410	Changing basic body position	1.30	1.10	1.60
d415	Maintaining a body position	1.20	1.30	150
d420	Transferring oneself	1.30	1.10	1.70
d430	Lifting and carrying objects	1.40	1.30	1.70
d435	Moving objects with lower extremities	1.40	1.20	1.80
d440	Fine hand use	1.50	1.10	1.70
d445	Hand and arm use	1.50	1.20	1.60
d446	Fine foot use	2.00	1.30	1.90
d450	Walking	1.40	1.10	1.50
d455	Moving around	1.60	1.50	1.20
d460	Moving around in different locations	1.70	1.10	1.20
d465	Moving around using equipment	2.00	1.30	1.10
d470	Using transportation	2.90	2.30	1.50
d475	Driving	3.70	3.50	3.10
d480	Riding animals for transportation	3.40	3.30	3.20

Chapter 5 Self-care

Code	Category	3–5 yrs (N=10)	6–12 yrs (N=10)	13–18 yrs (N=10)
d510	Washing oneself	2.50	1.20	1.30
d520	Caring for body parts	2.70	1.10	1.30
d530	Toileting	1.30	1.30	1.30
d540	Dressing	2.50	1.20	1.40
d550	Eating	1.80	1.30	1.50
d560	Drinking	1.90	1.40	1.70
d570	Looking after one's health	3.60	1.80	1.80
d571	Looking after one's safety	3.00	1.60	1.50

Chapter 6 Domestic life

Code	Category	3–5 yrs (N=10)	6–12 yrs (N=10)	13–18 yrs (N=10)
d610	Acquiring a place to live	3.90	3.90	3.50
d620	Acquisition of goods and services	3.80	2.70	2.30
d630	Preparing meals	3.80	3.20	2.00
d640	Doing housework	3.80	3.10	1.90
d650	Caring for household objects	3.60	3.10	3.10
d660	Assisting others	3.40	3.00	2.40

Chapter 7 Interpersonal interactions and relationships

Code	Category	3–5 yrs (N=10)	6–12 yrs (N=10)	13–18 yrs (N=10)
d710	Basic interpersonal interactions	2.20	2.50	2.60
d720	Complex interpersonal interactions	3.00	2.40	2.40
d730	Relating with strangers	3.30	2.10	2.50
d740	Formal relationships	3.70	3.30	3.80
d750	Informal social relationships	2.90	2.60	2.70
d760	Family relationships	3.00	2.60	2.70
d770	Intimate relationships	3.80	3.10	3.60

Chapter 8 Major life areas

Code	Category	3–5 yrs (N=10)	6–12 yrs (N=10)	13–18 yrs (N=10)
d810	Informal education	2.40	2.30	2.40
d815	Preschool education	1.30	2.30	3.80
d816	Preschool life and related activities	1.20	2.40	3.80
d820	School education	3.30	1.40	1.70
d825	Vocational training	4.00	3.30	1.80
d830	Higher education	4.00	3.50	3.40
d835	School life and related activities	4.00	2.00	2.20
d840	Apprenticeship (work preparation)	4.00	3.70	3.20
d845	Acquiring, keeping and terminating a job	4.00	3.70	3.50
d850	Remunerative employment	4.00	3.70	3.80
d855	Non-remunerative employment	4.00	3.90	3.20
d860	Basic economic transactions	3.30	2.50	2.40
d865	Complex economic transactions	4.00	3.80	3.90
d870	Economic self-sufficiency	4.00	3.70	3.80
d880	Engagement in play	1.40	1.70	2.10

Chapter 9 Community, social and civic life

Code	Category	3–5 yrs (N=10)	6–12 yrs (N=10)	13–18 yrs (N=10)
d910	Community life	3.70	3.40	3.30
d920	Recreation and leisure	3.40	2.10	1.80
d930	Religion and spirituality	3.50	2.50	3.00
d940	Human rights	3.80	3.30	3.20
d950	Political life and citizenship	3.80	3.70	3.90

Appendix K: Results of Third Delphi Survey in Activities & Participation

Chapter 1 Learning and applying knowledge

Code	Category	3–5 yrs (N=10)	6–12 yrs (N=10)	13–18 yrs (N=10)
d110	Watching	1.50	1.40	2.40
d115	Listening	1.70	1.60	•
d120	Other purposeful sensing	1.60	1.20	2.40
d130	Copying	1.20	1.30	1.70
d131	Learning through actions with objects	1.30	1.20	1.70
d132	Acquiring information	1.80	1.50	1.70
d133	Acquiring language	1.40	1.10	2.10
d134	Acquiring additional language	Excluded item	Excluded item	Excluded item
d135	Rehearsing	2.10	1.30	2.60
d137	Acquiring concepts	2.10	1.60	2.40
d140	Learning to read	2.80	1.10	2.30
d145	Learning to write	2.90	1.00	1.60
d150	Learning to calculate	3.50	1.20	2.40
d155	Acquiring skills	1.90	1.10	1.20
d160	Focusing attention	1.50	1.30	2.60
d161	Directing attention	1.50	1.20	2.50
d163	Thinking	Excluded item	3.00	2.70
d166	Reading	Excluded item	1.70	2.70
d170	Writing	Excluded item	1.20	1.20
d172	Calculating	Excluded item	1.30	2.80
d175	Solving problems	Excluded item	2.60	2.70
d177	Making decisions	Excluded item	2.70	2.80

Chapter 2 General tasks and demands

Code	Category	3–5 yrs (N=10)	6–12 yrs (N=10)	13–18 yrs (N=10)
d210	Undertaking a single task	1.70	1.70	1.20
d220	Undertaking multiple tasks	Excluded item	2.60	2.20
d230	Carrying out daily routine	3.00	1.70	1.50
d240	Handling stress and other psychological demands	Excluded item	2.80	2.70
d250	Managing one's own behaviour	Excluded item	2.20	2.30

Chapter 3 Communication

Code	Category	3–5 yrs (N=10)	6–12 yrs (N=10)	13–18 yrs (N=10)
d310	Communicating with - receiving - spoken messages	1.70	1.40	2.40
d315	Communicating with - receiving - nonverbal messages	1.30	1.20	2.30
d320	Communicating with - receiving - formal sign language messages	Excluded item	Excluded item	Excluded item
d325	Communicating with - receiving - written messages	Excluded item	1.70	2.30
d330	Speaking	2.30	1.00	2.00
d331	Pre-talking	1.20	1.20	3.50
d332	Singing	2.00	1.30	3.40
d335	Producing nonverbal messages	1.30	1.30	1.60
d340	Producing messages in formal sign language	Excluded item	Excluded item	Excluded item
d345	Writing messages	Excluded item	1.30	1.80
d350	Conversation	2.90	1.20	1.90
d355	Discussion	Excluded item	2.90	2.30
d360	Using communication devices and techniques	2.40	1.00	1.50

Chapter 4 Mobility

Code	Category	3–5 yrs (N=10)	6–12 yrs (N=10)	13–18 yrs (N=10)
d410	Changing basic body position	1.30	1.10	1.00
d415	Maintaining a body position	1.20	1.00	1.00
d420	Transferring oneself	1.10	1.00	1.00
d430	Lifting and carrying objects	1.30	1.00	1.00
d435	Moving objects with lower extremities	1.30	1.00	1.20
d440	Fine hand use	1.30	1.10	1.10
d445	Hand and arm use	1.20	1.00	1.00
d446	Fine foot use	2.60	1.10	1.10
d450	Walking	1.10	1.00	1.20
d455	Moving around	1.60	1.10	1.10
d460	Moving around in different locations	1.70	1.00	1.00
d465	Moving around using equipment	1.60	1.00	1.00
d470	Using transportation	2.60	2.70	1.00
d475	Driving	Excluded item	Excluded item	Excluded item
d480	Riding animals for transportation	Excluded item	Excluded item	Excluded item

Chapter 5 Self-care

Code	Category	3–5 yrs (N=10)	6–12 yrs (N=10)	13–18 yrs (N=10)
d510	Washing oneself	1.60	1.00	1.00
d520	Caring for body parts	2.40	1.10	1.20
d530	Toileting	1.40	1.00	1.10
d540	Dressing	2.00	1.00	1.20
d550	Eating	1.20	1.00	1.20
d560	Drinking	1.10	1.00	1.20
d570	Looking after one's health	Excluded item	1.80	1.20
d571	Looking after one's safety	Excluded item	1.30	1.00

Chapter 6 Domestic life

Code	Category	3–5 yrs (N=10)	6–12 yrs (N=10)	13–18 yrs (N=10)
d610	Acquiring a place to live	Excluded item	Excluded item	Excluded item
d620	Acquisition of goods and services	Excluded item	2.50	2.40
d630	Preparing meals	Excluded item	Excluded item	2.00
d640	Doing housework	Excluded item	Excluded item	1.50
d650	Caring for household objects	Excluded item	Excluded item	Excluded item
d660	Assisting others	Excluded item	Excluded item	3.00

Chapter 7 Interpersonal interactions and relationships

Code	Category	3–5 yrs (N=10)	6–12 yrs (N=10)	13–18 yrs (N=10)
d710	Basic interpersonal interactions	1.50	1.30	2.50
d720	Complex interpersonal interactions	Excluded item	2.40	2.20
d730	Relating with strangers	Excluded item	1.40	2.40
d740	Formal relationships	Excluded item	Excluded item	Excluded item
d750	Informal social relationships	2.70	1.30	2.40
d760	Family relationships	2.20	1.80	2.30
d770	Intimate relationships	Excluded item	Excluded item	Excluded item

Chapter 8 Major life areas

Code	Category	3–5 yrs (N=10)	6–12 yrs (N=10)	13–18 yrs (N=10)
d810	Informal education	1.50	1.50	2.20
d815	Preschool education	1.00	Excluded item	Excluded item
d816	Preschool life and related activities	1.20	Excluded item	Excluded item
d820	School education	Excluded item	1.30	1.50
d825	Vocational training	Excluded item	Excluded item	1.50
d830	Higher education	Excluded item	Excluded item	Excluded item
d835	School life and related activities	Excluded item	1.70	2.30
d840	Apprenticeship (work preparation)	Excluded item	Excluded item	1.50
d845	Acquiring, keeping and terminating a job	Excluded item	Excluded item	Excluded item
d850	Remunerative employment	Excluded item	Excluded item	Excluded item
d855	Non-remunerative employment	Excluded item	Excluded item	1.80
d860	Basic economic transactions	Excluded item	1.60	2.10
d865	Complex economic transactions	Excluded item	Excluded item	Excluded item
d870	Economic self-sufficiency	Excluded item	Excluded item	Excluded item
d880	Engagement in play	1.10	1.10	1.70

Chapter 9 Community, social and civic life

Code	Category	3–5 yrs (N=10)	6–12 yrs (N=10)	13–18 yrs (N=10)
d910	Community life	Excluded item	Excluded item	Excluded item
d920	Recreation and leisure	2.60	1.30	1.20
d930	Religion and spirituality	Excluded item	2.70	Excluded item
d940	Human rights	3.20	Excluded item	1.70
d950	Political life and citizenship	Excluded item	Excluded item	Excluded item

Appendix L: Results of First Delphi Survey in Environmental Factors

Chapter 1 Products and technology

Code	Category	3–5 yrs (N=10)	6–12 yrs (N=10)	13–18 yrs (N=10)
e110	Products or substances for personal consumption	2.30	1.50	2.20
e115	Products and technology for personal use in daily living	1.50	1.10	1.40
e120	Products and technology for personal indoor and outdoor mobility and transportation	1.50	1.20	1.10
e125	Products and technology for communication	2.00	1.10	1.10
e130	Products and technology for education	1.60	1.10	1.20
e135	Products and technology for employment	3.30	2.60	2.70
e140	Products and technology for culture, recreation and sport	2.30	1.60	1.40
e145	Products and technology for the practice of religion and spirituality	3.50	3.10	2.70
e150	Design, construction and building products and technology of buildings for public use	1.90	1.10	1.00
e155	Design, construction and building products and technology of buildings for private use	1.80	1.30	1.00
e160	Products and technology of land development	2.20	1.90	1.20
e165	Assets	3.70	3.50	3.20

Chapter 2 Natural environment and human-made changes to environment

Code	Category	3–5 yrs (N=10)	6–12 yrs (N=10)	13–18 yrs (N=10)
e210	Physical geography	3.00	2.00	1.90
e215	Population	3.20	3.10	3.10
e220	Flora and fauna	3.10	2.70	3.50
e225	Climate	2.90	2.60	2.50
e230	Natural events	3.20	3.00	2.80
e235	Human-caused events	3.10	3.20	2.60
e240	Light	2.90	3.10	3.30
e245	Time-related changes	2.80	2.70	3.20
e250	Sound	2.70	2.50	3.20
e255	Vibration	3.40	2.60	2.40
e260	Air quality	2.90	2.70	3.00

Chapter 3 Support and relationships

Code	Category	3–5 yrs (N=10)	6–12 yrs (N=10)	13–18 yrs (N=10)
e310	Immediate family	1.30	1.70	1.10
e315	Extended family	2.20	2.50	2.10
e320	Friends	1.90	1.30	1.20
e325	Acquaintances, peers, colleagues, neighbours and community members	2.90	2.50	1.70
e330	People in positions of authority	3.40	2.70	2.60
e335	People in subordinate positions	3.80	3.10	3.10
e340	Personal care providers and personal assistants	2.00	1.40	1.00
e345	Strangers	3.10	3.00	2.10
e350	Domesticated animals	2.60	2.90	2.70
e355	Health professionals	1.70	1.20	1.30
e360	Other professionals	3.00	2.40	2.30

Chapter 4 Attitudes

Code	Category	3–5 yrs (N=10)	6–12 yrs (N=10)	13–18 yrs (N=10)
e410	Individual attitudes of immediate family members	1.30	1.10	1.30
e415	Individual attitudes of extended family members	2.00	1.80	1.80
e420	Individual attitudes of friends	2.50	1.40	1.40
e425	Individual attitudes of acquaintances, peers, colleagues, neighbours and community members	2.60	2.40	1.40
e430	Individual attitudes of people in positions of authority	2.90	2.40	2.60
e435	Individual attitudes of people in subordinate positions	3.00	2.80	3.00
e440	Individual attitudes of personal care providers and personal assistants	1.80	1.20	1.30
e445	Individual attitudes of strangers	2.90	2.50	1.80
e450	Individual attitudes of health professionals	1.80	1.40	1.30
e455	Individual attitudes of other professionals	3.30	2.40	2.30
e460	Societal attitudes	2.50	3.10	1.70
e465	Social norms, practices and ideologies	2.70	2.50	2.20

Chapter 5 Services, systems and policies

Code	Category	3–5 yrs (N=10)	6–12 yrs (N=10)	13–18 yrs (N=10)
e510	Services, systems and policies for the production of consumer goods	2.90	2.20	2.10
e515	Architecture and construction services, systems and policies	2.20	2.30	1.60
e520	Open space planning services, systems and policies	2.60	2.60	1.60
e525	Housing services, systems and policies	3.30	2.90	2.60
e530	Utilities services, systems and policies	3.40	3.10	2.70
e535	Communication services, systems and policies	3.00	2.60	2.70
e540	Transportation services, systems and policies	1.80	1.70	1.20
e545	Civil protection services, systems and policies	3.60	3.20	2.70
e550	Legal services, systems and policies	2.30	2.50	1.60
e555	Associations and organizational services, systems and policies	2.20	2.50	1.70
e560	Media services, systems and policies	2.50	2.60	1.60
e565	Economic services, systems and policies	3.50	3.40	3.00
e570	Social security services, systems and policies	2.00	2.10	2.10
e575	General social support services, systems and policies	1.60	1.50	1.20
e580	Health services, systems and policies	1.70	1.40	1.40
e585	Education and training services, systems and policies	2.10	1.40	1.40
e590	Labour and employment services, systems and policies	3.90	3.40	2.80
e595	Political services, systems and policies	3.80	3.50	3.20

Appendix M: Results of Third Delphi Survey in Environmental Factors

Chapter 1 Products and technology

Code	Category	3–5 yrs (N=10)	6–12 yrs (N=10)	13–18 yrs (N=10)
e110	Products or substances for personal consumption	1.50	1.50	1.30
e115	Products and technology for personal use in daily living	1.10	1.00	1.00
e120	Products and technology for personal indoor and outdoor mobility and transportation	1.10	1.00	1.00
e125	Products and technology for communication	1.40	1.00	1.00
e130	Products and technology for education	1.30	1.00	1.00
e135	Products and technology for employment	Excluded item	3.10	3.10
e140	Products and technology for culture, recreation and sport	1.50	1.20	1.00
e145	Products and technology for the practice of religion and spirituality	Excluded item	Excluded item	Excluded item
e150	Design, construction and building products and technology of buildings for public use	1.30	1.00	1.00
e155	Design, construction and building products and technology of buildings for private use	1.20	1.10	1.00
e160	Products and technology of land development	2.40	1.70	1.00
e165	Assets	Excluded item	Excluded item	Excluded item

Chapter 2 Natural environment and human-made changes to environment

Code	Category	3–5 yrs (N=10)	6–12 yrs (N=10)	13–18 yrs (N=10)
e210	Physical geography	Excluded item	2.90	1.10
e215	Population	Excluded item	Excluded item	Excluded item
e220	Flora and fauna	Excluded item	3.00	Excluded item
e225	Climate	2.90	3.00	2.00
e230	Natural events	Excluded item	Excluded item	2.50
e235	Human-caused events	Excluded item	Excluded item	2.60
e240	Light	2.80	3.30	Excluded item
e245	Time-related changes	3.10	Excluded item	Excluded item
e250	Sound	2.70	1.40	Excluded item
e255	Vibration	Excluded item	3.10	2.00
e260	Air quality	2.80	3.00	1.30

Chapter 3 Support and relationships

Code	Category	3–5 yrs (N=10)	6–12 yrs (N=10)	13–18 yrs (N=10)
e310	Immediate family	1.00	1.00	1.00
e315	Extended family	1.80	1.60	1.70
e320	Friends	1.20	1.00	1.00
e325	Acquaintances, peers, colleagues, neighbours and community members	2.80	1.60	1.00
e330	People in positions of authority	Excluded item	2.70	1.90
e335	People in subordinate positions	Excluded item	Excluded item	Excluded item
e340	Personal care providers and personal assistants	1.40	1.00	1.00
e345	Strangers	Excluded item	Excluded item	1.60
e350	Domesticated animals	2.60	2.90	2.20
e355	Health professionals	1.00	1.00	1.00
e360	Other professionals	Excluded item	1.50	1.60

Chapter 4 Attitudes

Code	Category	3–5 yrs (N=10)	6–12 yrs (N=10)	13–18 yrs (N=10)
e410	Individual attitudes of immediate family members	1.00	1.00	1.00
e415	Individual attitudes of extended family members	1.50	1.40	1.10
e420	Individual attitudes of friends	2.30	1.30	1.00
e425	Individual attitudes of acquaintances, peers, colleagues, neighbours and community members	2.60	2.50	1.00
e430	Individual attitudes of people in positions of authority	Excluded item	3.00	2.40
e435	Individual attitudes of people in subordinate positions	Excluded item	3.10	Excluded item
e440	Individual attitudes of personal care providers and personal assistants	1.00	1.00	1.00
e445	Individual attitudes of strangers	3.30	2.80	1.30
e450	Individual attitudes of health professionals	1.30	1.00	1.00
e455	Individual attitudes of other professionals	Excluded item	2.50	1.80
e460	Societal attitudes	2.70	Excluded item	1.10
e465	Social norms, practices and ideologies	2.90	3.20	2.10

Chapter 5 Services, systems and policies

Code	Category	3–5 yrs (N=10)	6–12 yrs (N=10)	13–18 yrs (N=10)
e510	Services, systems and policies for the production of consumer goods	3.20	2.80	1.80
e515	Architecture and construction services, systems and policies	2.40	2.60	1.00
e520	Open space planning services, systems and policies	3.20	2.60	1.00
e525	Housing services, systems and policies	Excluded item	Excluded item	1.90
e530	Utilities services, systems and policies	Excluded item	Excluded item	3.10
e535	Communication services, systems and policies	Excluded item	2.90	2.70
e540	Transportation services, systems and policies	1.30	1.40	1.00
e545	Civil protection services, systems and policies	Excluded item	Excluded item	3.00
e550	Legal services, systems and policies	1.40	2.80	1.10
e555	Associations and organizational services, systems and policies	2.40	3.20	1.50
e560	Media services, systems and policies	3.00	2.70	1.00
e565	Economic services, systems and policies	Excluded item	Excluded item	Excluded item
e570	Social security services, systems and policies	1.20	2.70	1.80
e575	General social support services, systems and policies	1.10	1.10	1.00
e580	Health services, systems and policies	1.00	1.30	1.00
e585	Education and training services, systems and policies	1.80	1.30	1.00
e590	Labour and employment services, systems and policies	Excluded item	Excluded item	3.00
e595	Political services, systems and policies	Excluded item	Excluded item	Excluded item

Appendix N: ICF-CY Code Set for Pupils with physical disabilities in 3–5 Years Old

Body Function	
b110	Consciousness functions
b114	Orientation functions
b117	Intellectual functions
b140	Attention functions
b144	Memory functions
b147	Psychomotor functions
b152	Emotional functions
b156	Perceptual functions
b160	Thought functions
b163	Basic cognitive functions
b167	Mental functions of language
b176	Mental function of sequencing complex movements
b210	Seeing functions
b230	Hearing functions
b235	Vestibular functions
b260	Proprioceptive function
b270	Sensory functions related to temperature and other stimuli
b310	Voice functions
b320	Articulation functions
b330	Fluency and rhythm of speech functions
b410	Heart functions
b440	Respiration functions
b445	Respiratory muscle functions
b510	Ingestion functions
b515	Digestive functions
b525	Defecation functions
b530	Weight maintenance functions
b560	Growth maintenance functions
b620	Urination functions
b630	Sensations associated with urinary functions
b710	Mobility of joint functions
b715	Stability of joint functions
b720	Mobility of bone functions
b730	Muscle power functions
b735	Muscle tone functions
b740	Muscle endurance functions
b750	Motor reflex functions
b755	Involuntary movement reaction functions
b760	Control of voluntary movement functions
b761	Spontaneous movements
b765	Involuntary movement functions
b770	Gait pattern functions
b780	Sensations related to muscles and movement functions
Body Structure	
s110	Structure of brain
s120	Spinal cord and related structures
s130	Structure of meninges
s320	Structure of mouth
s340	Structure of larynx
s410	Structure of cardiovascular system
s430	Structure of respiratory system
s710	Structure of head and neck region
s720	Structure of shoulder region
s730	Structure of upper extremity
s740	Structure of pelvic region

s750	Structure of lower extremity
s770	Additional musculoskeletal structures related to movement
Activities and Participation	
d110	Watching
d115	Listening
d120	Other purposeful sensing
d130	Copying
d131	Learning through actions with objects
d132	Acquiring information
d133	Acquiring language
d155	Acquiring skills
d160	Focusing attention
d161	Directing attention
d210	Undertaking a single task
d310	Communicating with - receiving - spoken messages
d315	Communicating with - receiving - nonverbal messages
d331	Pre-talking
d335	Producing nonverbal messages
d410	Changing basic body position
d415	Maintaining a body position
d420	Transferring oneself
d430	Lifting and carrying objects
d435	Moving objects with lower extremities
d440	Fine hand use
d445	Hand and arm use
d450	Walking
d455	Moving around
d460	Moving around in different locations
d465	Moving around using equipment
d510	Washing oneself
d530	Toileting
d550	Eating
d560	Drinking
d710	Basic interpersonal interactions
d810	Informal education
d815	Preschool education
d816	Preschool life and related activities
d880	Engagement in play
Environmental Factors	
e110	Products or substances for personal consumption
e115	Products and technology for personal use in daily living
e120	Products and technology for personal indoor and outdoor mobility and transportation
e125	Products and technology for communication
e130	Products and technology for education
e140	Products and technology for culture, recreation and sport
e150	Design, construction and building products and technology of buildings for public use
e155	Design, construction and building products and technology of buildings for private use
e310	Immediate family
e315	Extended family
e320	Friends
e340	Personal care providers and personal assistants
e355	Health professionals
e410	Individual attitudes of immediate family members
e415	Individual attitudes of extended family members
e440	Individual attitudes of personal care providers and personal assistants
e450	Individual attitudes of health professionals
e540	Transportation services, systems and policies
e550	Legal services, systems and policies

e570	Social security services, systems and policies
e575	General social support services, systems and policies
e580	Health services, systems and policies
e585	Education and training services, systems and policies

Appendix O: ICF-CY Code Set for Pupils with physical disabilities in 6–12 Years Old

Body Function	
b110	Consciousness functions
b114	Orientation functions
b117	Intellectual functions
b122	Global psychosocial functions
b125	Dispositions and intra-personal functions
b126	Temperament and personality functions
b130	Energy and drive functions
b140	Attention functions
b144	Memory functions
b147	Psychomotor functions
b152	Emotional functions
b156	Perceptual functions
b160	Thought functions
b163	Basic cognitive functions
b164	Higher-level cognitive functions
b167	Mental functions of language
b172	Calculation functions
b176	Mental function of sequencing complex movements
b180	Experience of self and time functions
b210	Seeing functions
b230	Hearing functions
b260	Proprioceptive function
b270	Sensory functions related to temperature and other stimuli
b280	Sensation of pain
b310	Voice functions
b320	Articulation functions
b330	Fluency and rhythm of speech functions
b410	Heart functions
b440	Respiration functions
b445	Respiratory muscle functions
b455	Exercise tolerance functions
b460	Sensations associated with cardiovascular and respiratory functions
b510	Ingestion functions
b515	Digestive functions
b525	Defecation functions
b530	Weight maintenance functions
b560	Growth maintenance functions
b620	Urination functions
b630	Sensations associated with urinary functions
b710	Mobility of joint functions
b715	Stability of joint functions
b720	Mobility of bone functions
b730	Muscle power functions
b735	Muscle tone functions
b740	Muscle endurance functions
b750	Motor reflex functions
b755	Involuntary movement reaction functions
b760	Control of voluntary movement functions
b761	Spontaneous movements
b765	Involuntary movement functions
b770	Gait pattern functions
b780	Sensations related to muscles and movement functions
Body Structure	
s110	Structure of brain
s120	Spinal cord and related structures

s320	Structure of mouth
s410	Structure of cardiovascular system
s430	Structure of respiratory system
s710	Structure of head and neck region
s720	Structure of shoulder region
s730	Structure of upper extremity
s740	Structure of pelvic region
s750	Structure of lower extremity
s760	Structure of trunk
s770	Additional musculoskeletal structures related to movement
Activities and Participation	
d110	Watching
d115	Listening
d120	Other purposeful sensing
d130	Copying
d131	Learning through actions with objects
d132	Acquiring information
d133	Acquiring language
d135	Rehearsing
d137	Acquiring concepts
d140	Learning to read
d145	Learning to write
d150	Learning to calculate
d155	Acquiring skills
d160	Focusing attention
d161	Directing attention
d166	Reading
d170	Writing
d172	Calculating
d210	Undertaking a single task
d230	Carrying out daily routine
d310	Communicating with - receiving - spoken messages
d315	Communicating with - receiving - nonverbal messages
d325	Communicating with - receiving - written messages
d330	Speaking
d331	Pre-talking
d332	Singing
d335	Producing nonverbal messages
d345	Writing messages
d350	Conversation
d360	Using communication devices and techniques
d410	Changing basic body position
d415	Maintaining a body position
d420	Transferring oneself
d430	Lifting and carrying objects
d435	Moving objects with lower extremities
d440	Fine hand use
d445	Hand and arm use
d446	Fine foot use
d450	Walking
d455	Moving around
d460	Moving around in different locations
d465	Moving around using equipment
d510	Washing oneself
d520	Caring for body parts
d530	Toileting
d540	Dressing
d550	Eating
d560	Drinking

d570	Looking after one's health
d571	Looking after one's safety
d710	Basic interpersonal interactions
d730	Relating with strangers
d750	Informal social relationships
d760	Family relationships
d810	Informal education
d820	School education
d835	School life and related activities
d860	Basic economic transactions
d880	Engagement in play
d920	Recreation and leisure
Environmental Factors	
e110	Products or substances for personal consumption
e115	Products and technology for personal use in daily living
e120	Products and technology for personal indoor and outdoor mobility and transportation
e125	Products and technology for communication
e130	Products and technology for education
e140	Products and technology for culture, recreation and sport
e150	Design, construction and building products and technology of buildings for public use
e155	Design, construction and building products and technology of buildings for private use
e160	Products and technology of land development
e250	Sound
e310	Immediate family
e315	Extended family
e320	Friends
e325	Acquaintances, peers, colleagues, neighbours and community members
e340	Personal care providers and personal assistants
e355	Health professionals
e360	Other professionals
e410	Individual attitudes of immediate family members
e415	Individual attitudes of extended family members
e420	Individual attitudes of friends
e440	Individual attitudes of personal care providers and personal assistants
e450	Individual attitudes of health professionals
e540	Transportation services, systems and policies
e575	General social support services, systems and policies
e580	Health services, systems and policies
e585	Education and training services, systems and policies

Appendix P: ICF-CY Code Set for Pupils with physical disabilities in 13–18 Years Old

Body Function	
b110	Consciousness functions
b114	Orientation functions
b117	Intellectual functions
b122	Global psychosocial functions
b125	Dispositions and intra-personal functions
b126	Temperament and personality functions
b130	Energy and drive functions
b134	Sleep functions
b140	Attention functions
b144	Memory functions
b147	Psychomotor functions
b152	Emotional functions
b156	Perceptual functions
b160	Thought functions
b163	Basic cognitive functions
b164	Higher-level cognitive functions
b167	Mental functions of language
b172	Calculation functions
b176	Mental function of sequencing complex movements
b180	Experience of self and time functions
b210	Seeing functions
b235	Vestibular functions
b240	Sensations associated with hearing and vestibular function
b260	Proprioceptive function
b265	Touch function
b270	Sensory functions related to temperature and other stimuli
b280	Sensation of pain
b310	Voice functions
b320	Articulation functions
b330	Fluency and rhythm of speech functions
b340	Alternative vocalization functions
b410	Heart functions
b440	Respiration functions
b445	Respiratory muscle functions
b455	Exercise tolerance functions
b460	Sensations associated with cardiovascular and respiratory functions
b510	Ingestion functions
b515	Digestive functions
b520	Assimilation functions
b525	Defecation functions
b530	Weight maintenance functions
b535	Sensations associated with the digestive system
b540	General metabolic functions
b550	Thermoregulatory functions
b560	Growth maintenance functions
b620	Urination functions
b630	Sensations associated with urinary functions
b710	Mobility of joint functions
b715	Stability of joint functions
b720	Mobility of bone functions
b730	Muscle power functions
b735	Muscle tone functions
b740	Muscle endurance functions
b750	Motor reflex functions
b755	Involuntary movement reaction functions
b760	Control of voluntary movement functions

b761	Spontaneous movements
b765	Involuntary movement functions
b770	Gait pattern functions
b780	Sensations related to muscles and movement functions
Body Structure	
s110	Structure of brain
s120	Spinal cord and related structures
s320	Structure of mouth
s410	Structure of cardiovascular system
s420	Structure of immune system
s430	Structure of respiratory system
s610	Structure of urinary system
s710	Structure of head and neck region
s720	Structure of shoulder region
s730	Structure of upper extremity
s740	Structure of pelvic region
s750	Structure of lower extremity
s760	Structure of trunk
s770	Additional musculoskeletal structures related to movement
Activities and Participation	
d130	Copying
d131	Learning through actions with objects
d132	Acquiring information
d145	Learning to write
d155	Acquiring skills
d170	Writing
d210	Undertaking a single task
d230	Carrying out daily routine
d335	Producing nonverbal messages
d345	Writing messages
d350	Conversation
d360	Using communication devices and techniques
d410	Changing basic body position
d415	Maintaining a body position
d420	Transferring oneself
d430	Lifting and carrying objects
d435	Moving objects with lower extremities
d440	Fine hand use
d445	Hand and arm use
d446	Fine foot use
d450	Walking
d455	Moving around
d460	Moving around in different locations
d465	Moving around using equipment
d470	Using transportation
d510	Washing oneself
d520	Caring for body parts
d530	Toileting
d540	Dressing
d550	Eating
d560	Drinking
d570	Looking after one’s health
d571	Looking after one’s safety
d640	Doing housework
d820	School education
d825	Vocational training
d840	Apprenticeship (work preparation)
d855	Non-remunerative employment

d880	Engagement in play
d920	Recreation and leisure
d940	Human rights
Environmental Factors	
e110	Products or substances for personal consumption
e115	Products and technology for personal use in daily living
e120	Products and technology for personal indoor and outdoor mobility and transportation
e125	Products and technology for communication
e130	Products and technology for education
e140	Products and technology for culture, recreation and sport
e150	Design, construction and building products and technology of buildings for public use
e155	Design, construction and building products and technology of buildings for private use
e160	Products and technology of land development
e210	Physical geography
e260	Air quality
e310	Immediate family
e315	Extended family
e320	Friends
e325	Acquaintances, peers, colleagues, neighbours and community members
e330	People in positions of authority
e340	Personal care providers and personal assistants
e345	Strangers
e355	Health professionals
e360	Other professionals
e410	Individual attitudes of immediate family members
e415	Individual attitudes of extended family members
e420	Individual attitudes of friends
e425	Individual attitudes of acquaintances, peers, colleagues, neighbours and community members
e440	Individual attitudes of personal care providers and personal assistants
e445	Individual attitudes of strangers
e450	Individual attitudes of health professionals
e455	Individual attitudes of other professionals
e460	Societal attitudes
e510	Services, systems and policies for the production of consumer goods
e515	Architecture and construction services, systems and policies
e520	Open space planning services, systems and policies
e525	Housing services, systems and policies
e540	Transportation services, systems and policies
e550	Legal services, systems and policies
e555	Associations and organizational services, systems and policies
e560	Media services, systems and policies
e570	Social security services, systems and policies
e575	General social support services, systems and policies
e580	Health services, systems and policies
e585	Education and training services, systems and policies